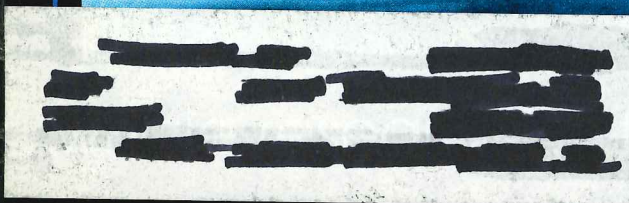
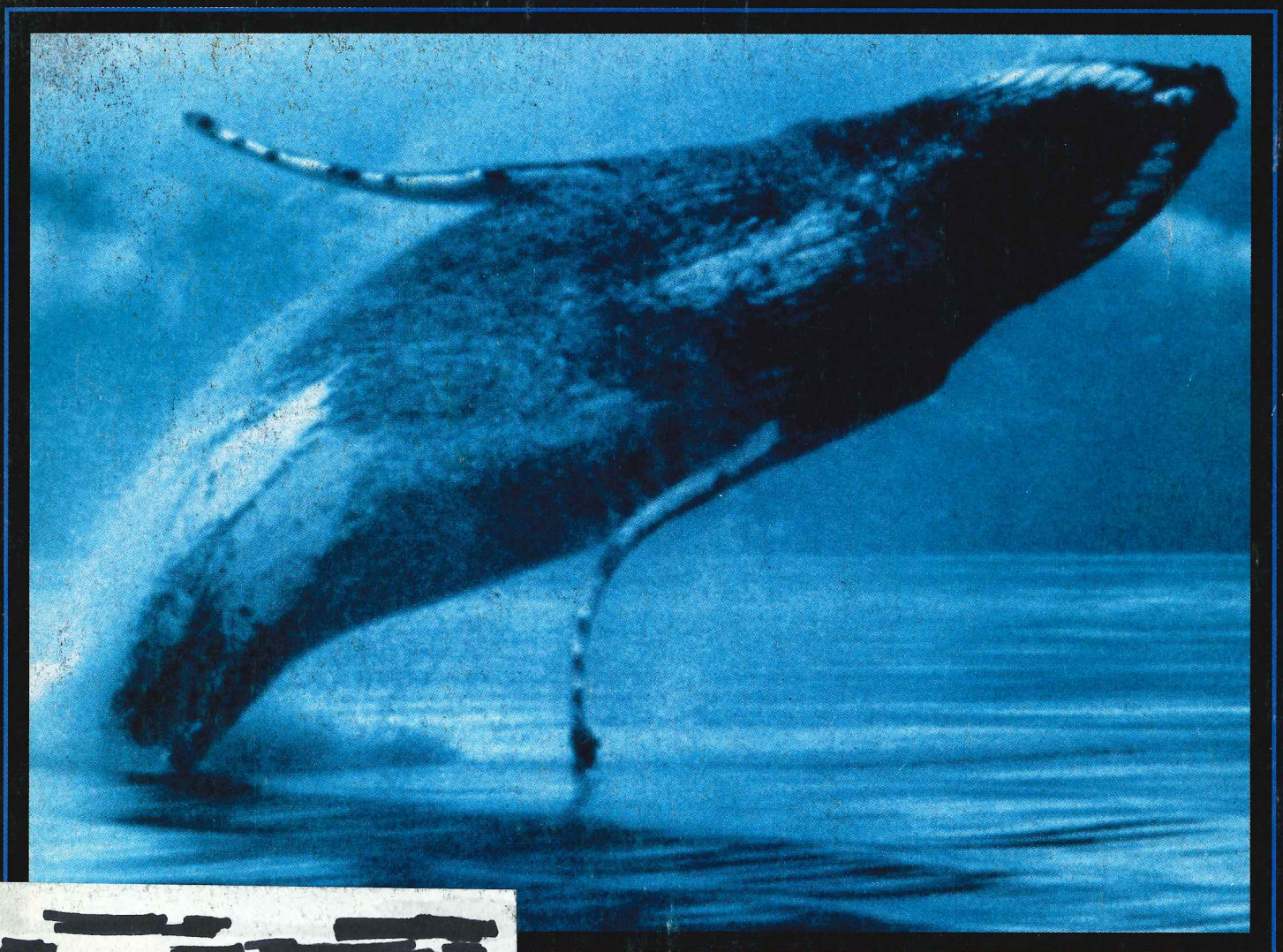


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(*) Benchmark run on an IBM PC using MS Pascal version 3.2 and the DOS linker version 2.6. The 179 line program used is the "Gauss-Seidel" program out of Alan R. Miller's book: "Pascal programs for scientists and engineers" (Sybex, page 128) with a 3 dimensional non-singular matrix and a relaxation coefficient of 1.0.



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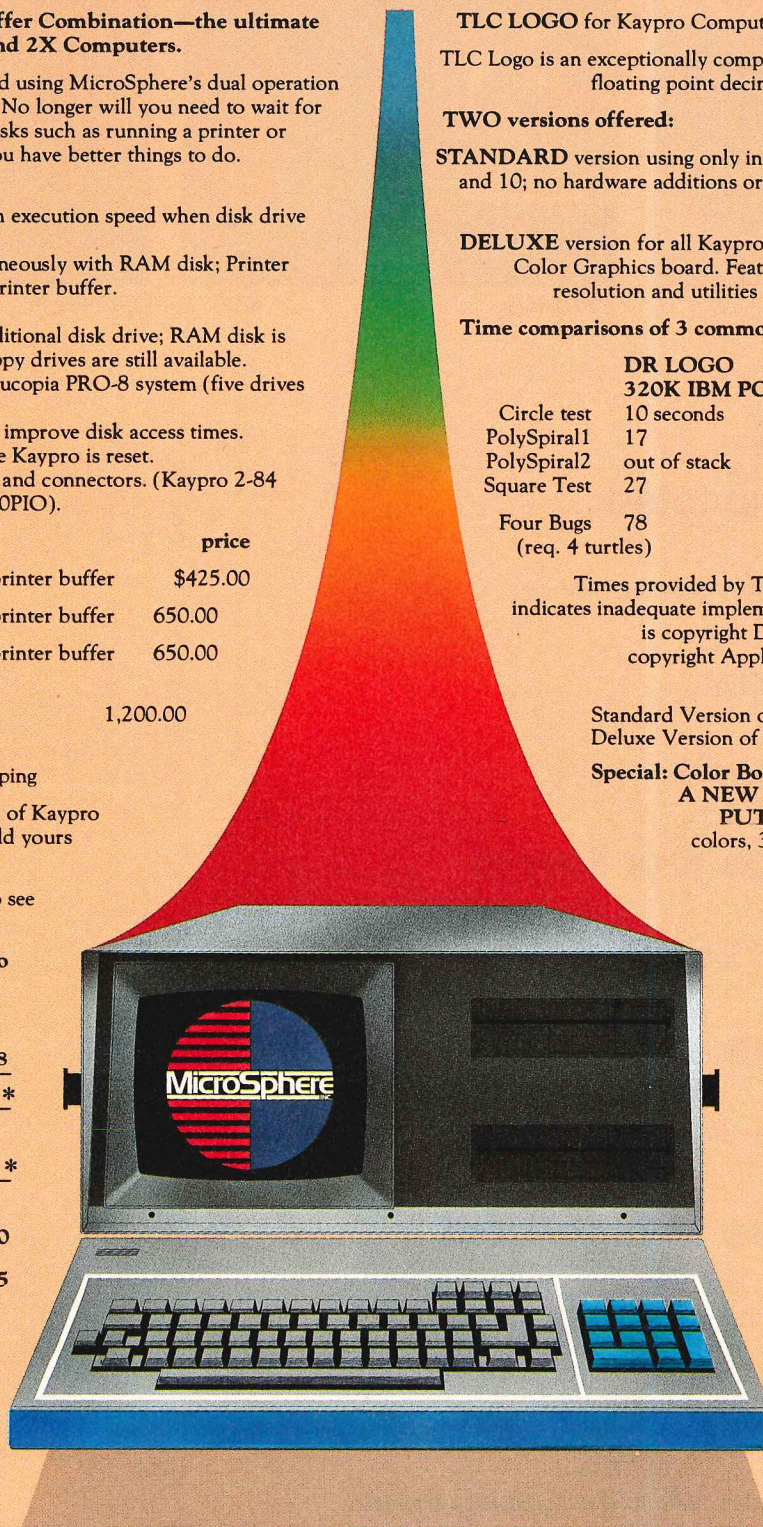
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Square Test	27	10	41
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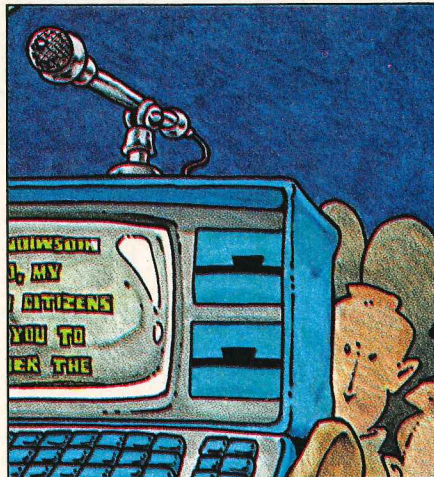


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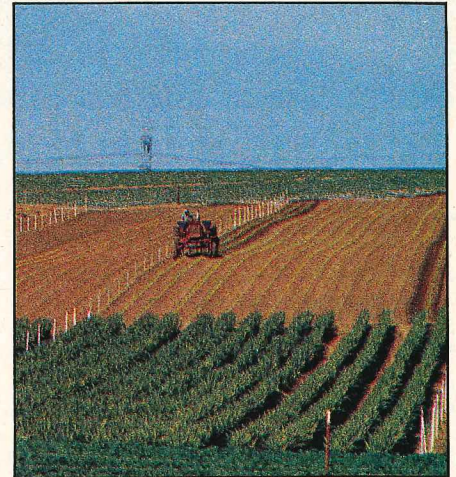
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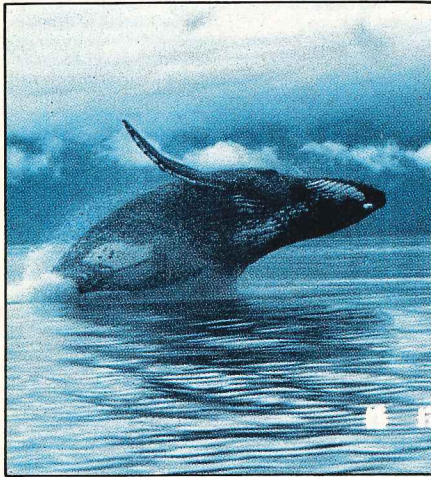
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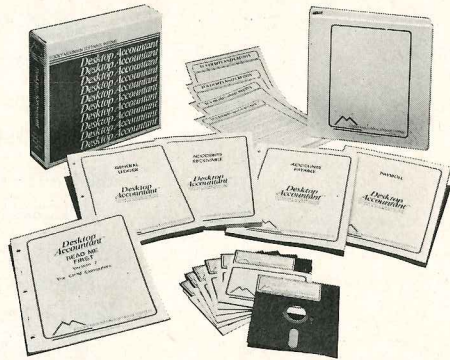
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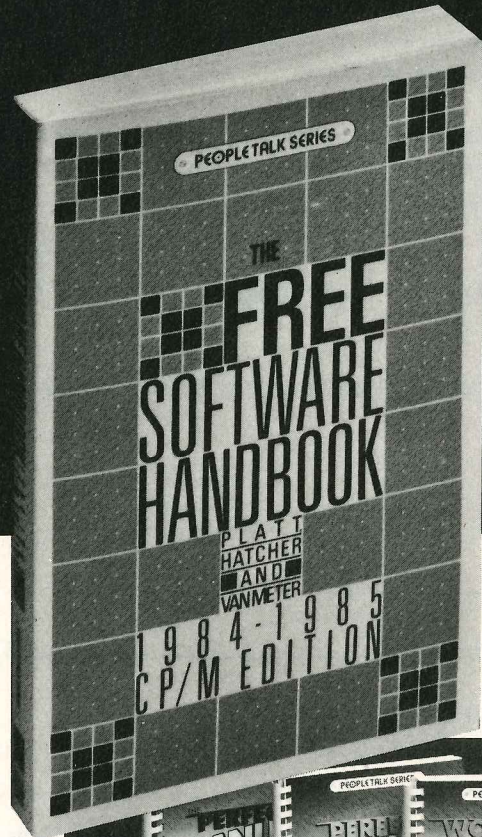
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Other correspondence

If you wish to make comments or inquiries regarding editorial content, please write to:

PROFILES
Editorial Department
533 Stevens Avenue
Solana Beach, CA 92075

If you write a "Letter to the Editor," or have a question for our "Q & A" section, please write that on the outside of the envelope with "Attn: Q & A" or similar notation.

Article queries should be addressed to the Submissions Editor and mailed to the Editorial Department's address above.

Please include a brief outline of your article idea, writing samples if available, and a self-addressed, stamped envelope (SASE). Allow at least four weeks for a reply.

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Letters

An index, please

You do, as many have told you, produce a damn good magazine. Do you have an index of back copies?

Kenneth F. Smith
Duluth, Georgia

We have contracted for an index and plan to run it at year's end, if not sooner.

Alternative to DDT

In the December/January 1984 issue, Jim Spickard's excellent article ("Academic Writing with WordStar") neglects one important point concerning the "long delay" display of the MicroPro commercial: You can "disappear" it immediately with a simple "Return"! For those of us who don't (or can't) fuss with DDT, this one extra keystroke is a much simpler solution.

Henry M. Taylor
Columbia, Missouri

Read what Dick Lutz has to say in this issue about WFAST16, a submit file that will make all the DDT speed-up patches for you.

WordStar lists and Lee's book

Did you ever make up or get the alpha and functional lists for WordStar?

Jaro Mayda
Rio Peidras, Puerto Rico

P.S.: Where to order John D. Lee's book by mail?

Covill Associates no longer sells its valuable list of WordStar

commands grouped by function and listed alphabetically. They have agreed, however, to lend us their disk file, let us add more to the list, and run it either in the magazine or as a promotional piece.

To get Lee's excellent book, ask for John D. Lee's WordStar and CP/M Made Easy, (ISBN 0471-90188-1) and enclose a check for the total of \$17.95 plus \$3.85 shipping, plus any local taxes. Send to:

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1 Wiley Drive
Sumerset, NJ 08873*

What's new in the CP/M world?

I am dying to keep abreast of the latest in the Kaypro and CP/M world. Is there a publication similar to *PC Magazine* for CP/M systems?

As you are aware, the market is now inundated with MS-DOS publications, software, peripherals, etc. . . . My urgent needs are for Kaypro/CP/M publications, software, peripherals, etc. I am an ardent reader and my intention is to subscribe to as many publications as feasible. Please advise.

Otto V. Latimer, Jr.
Miami, Florida

Your nearest major book or computer store should have the latest copy of Byte (though its coverage of CP/M is dwindling); see this issue for Micro Cornucopia's ad (offers excellent technical writing, often Kaypro-specific); and see our February issue's list of Users' Groups for newsletter addresses—

KUGRAM and NATKUG in New York come to mind. KAYOS KAYPERS is a lesser-known, but excellent, newsletter published by Margot Wood, 210 South Guadalupe Avenue, Redondo Beach, CA 90277. (Margot will soon be writing regularly for PROFILES). For good non-technical tutorials on dBASE, Perfect Writer, WordStar and the like, check out The User's Guide, P.O. Box 5245, Redwood City, CA 94063 (\$18/year for six issues). And advanced technical types should consider Dr. Dobbs Journal, M & T Publishing Inc, 2464 Embarcadero Way, Palo Alto, CA 94303 (\$25/year for 12 issues.) Also see magazine descriptions in Stewart Brand's Whole Earth Software Catalog (\$17.50, Quantum Press/Doubleday).

On improving PROFILES

For responses to the following, see this issue's Editor's Notes.

You asked for feedback [November 1984 issue] about your plans for upcoming issues of *PROFILES*.

Articles about famous Kaypro users, the effects of micros on American life and the future of microcomputing do not belong in *PROFILES*, in my estimation.

They are general articles that will not in any way help me to work with, enjoy or appreciate my Kaypro.

PROFILES should limit itself to articles that relate specifically to Kaypros in some way. For example, I do not plan to ever use COBOL, but if I ever do, I now have a reference about using it with Kaypro. Ditto your articles

on Kamas and DataStar.
[November '84].

The first four articles in the [November '84] issue were sort of related to Kaypro and thus okay. The two articles on public domain software were specifically Kaypro-oriented and very valuable.

George H. Klumpner
Oak Park, Illinois

... What would I like to see? More articles on languages such as Turbo Pascal, dBASE II, the MicroPro family, and CBASIC. Also, a monthly column on what's new at Kaypro. We, the current family of Kaypro owners, are probably the best promoters of Kaypro to new prospects. It is embarrassing to go to a dealer with a prospect and find that most of what you told him is now obsolete. I know you value your editorial independence from Kaypro, but please let us know what is going on.

R.S. Ochsner
Sandia Park, New Mexico

Many want info on Kaypro

... one piece of information that is lacking in your magazine is news about what is happening at Kaypro.

Robie and the 12X seem to have evaporated...

Patricia Zeman
La Grange Park, Illinois

... those of us who bought Kaypros as long as eight to ten months ago would be *very* interested in detailed descriptions of new models...

Channing H. Lushbough
Glenview, Illinois

Corrections

The article "Around The World at 300 Baud" (February 1985) contained a list of electronic bulletin boards and the phone numbers by which they could be reached. The number listed for the McGraw-Hill Books board was incorrect. That bulletin board no longer exists, and the phone number we listed is now that of a private household. **PROFILES** requests that readers refrain from calling that number.

Also, our listing of Kaypro users' groups included a phone number for the group Bad Sector in the San Francisco area. This group has disbanded. Those who were interested in membership should contact Kathleen Barnes at the San Francisco Kaypro Users' Group (415/922-8093) instead.

Beginners need help, too!

I have yet to read an article on *my* level. Most of the time, I don't know what you are talking about. I use my Kaypro to keep books for a small business in my home and as a word processor for letters and data to be printed and mailed.

I like the machine, but your discussions of new things are way over my head. Beginners need help, too!

Jean Stevens
Sheney, Washington

Letters to the Editor
PROFILES Magazine
533 Stevens Ave.
Solana Beach, CA 92075

MENU MANAGER™ FOR THE KAYPRO™ 10 & ROBIE

Finally, it is possible to make changes in the Master Menu of your Kaypro 10 or Robie. You no longer have to have a menu loaded with programs which you may never use. You can now add those programs, such as accounting packages or mailing label routines, which you use regularly in your work.

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Q & A

by Tom Enright

We welcome and read all your letters. Some of the letters are of general interest and are printed in the Letters column; others are pleas for technical help. Those questions that lend themselves to simple, concise answers are dealt with here, while the more advanced topics develop into articles or discussions in the Technical Forum.

Due to the volume of mail we receive, we simply can't respond personally to every request for assistance. For questions requiring a more immediate reply, contact your dealer. Kaypro Technical Support is now giving preference to dealer calls over end-users. This means that it will be even more difficult to get them on the phone. They are still at (619) 481-3920. Or you can write to Kaypro Software Technical Support, P.O. Box N, Del Mar, CA, 92014. Please include a daytime phone number in any letters.

Juki problems and the cure

In August 1984 I purchased a Kaypro Business Pak. I am well pleased with the computer; the Juki printer, however, has been less than exceptional.

The printer does an extremely poor job on envelopes, regardless of the impact setting. Worse than the print quality on envelopes are the ribbon jams. On every single ribbon, IBM Selectric or other manufacturer, the take-up reel has become clogged toward the end and jammed.

The worst part is that this doesn't happen at the end of the ribbon. There are always many feet of usable ribbon left. To uti-

lize the rest of the spool, I have to cut the ribbon, pull off 20 feet or more, use tape to splice it back together, then reinstall the cartridge on the printer. Not satisfactory at all. Am I expected to junk the cartridge at this stage and forfeit the remaining ribbon?

John Marshall
Boone, North Carolina

You definitely are not expected to put up with that performance. What you describe indicates two separate problems on the printer. Both of them should be repairable. The first one involves an adjustment on the take-up reel mechanism so you can use the full ribbon. The problem with envelopes sounds like the platen isn't holding the envelopes tightly enough. This should be fixable by an adjustment of the platen tension, or replacement of the "slave CPU board" inside the printer.

Both of these fixes are available from the XEROX AMERICARE service center nearest you. The printers sold with the Kaypro Business Pak are warranted for one year. Warranty service is available at XEROX service centers, at no charge to you. Kaypro has a service agreement with XEROX to do warranty service on all Kaypro products, including the Juki printers.

Micro-justification

I recently purchased a Kaypro 2 and a Dynax-DX 15 (Brother HR-15) printer. I am most interested in improving the appearance of the text with proportional spacing and micro-

justification.

I have seen advertisements in your magazine and elsewhere that promise to add proportional spacing and micro-justification to WordStar. Although the system I am now using produces a good quality document, I still have the problem of full spaces inserted to justify the right margin. Since the appearance of the documents is as important to my customers as it is to me, I want to produce the best quality documents that state of the art allows.

My printer is capable of proportional spacing and I can get proportional printwheels. I realize that there is more to solving the problem than that. Can you help?

Jim Lucas
Springfield, Missouri

The Dynax-DX 15 emulates Diablo 630 control codes. It's also capable of proportional printing and micro-justification. Before you buy one of the third-party software packages to take advantage of these features, you might try one little trick. Using WINSTALL, reinstall WordStar for the Diablo 630. Then print a test document using a proportional printwheel.

If that doesn't give the results you need, then go out and buy one of the third-party enhancements to WordStar.

I/O byte quandary

A question unanswered in David Weinberger's article on the I/O byte (October 1984): With the "BAT" option not functional on the Kaypro, what is a practical way to divert console output to

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the printer—in other words, to do from within a program or SUB file what CTRL-P does from the console?

Ken Stone
Glendale, California

On Kaypro computers, redirecting console output to the printer works only if you are using a serial printer. Resetting CON: to TTY: sends console output to a serial printer rather nicely. However, you'll need to be certain that the I/O byte returns CON: to CRT: before asking for any input. Otherwise the prompt to enter information goes to the printer instead of the screen.

If you have a parallel printer, you're out of luck. I am aware of no way to redirect console output to a parallel printer. I have heard rumors of a location in the MBASIC interpreter that can redirect output. Unfortunately, I've never found out what address to POKE a value into to test the rumor out.

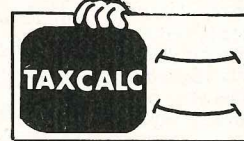
Which power conditioner

"Power Conditioners: Who Needs 'em?" in December *PROFILES* was quite interesting, but you left out the most important information. What kind of power conditioning do Kaypros need? Specifically, what are the volt-amp ratings for the Kaypro II, 2, 2X, 4 and 10? Also, what is the minimum response time that will safely protect these computers?

W. Meacham
Austin, Texas

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Now we are pleased to tell you about the newest internal modem option for your KayPro...the DS300SMT, a Hayes compatible, 300 baud smartmodem. Guess you could say... "we're getting smarter!"

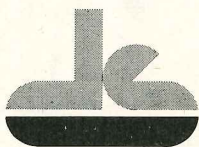
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All of the Datasolvers internal modems come complete with software on diskette (or you can use MITE, the new communications software now being bundled with KayPro's) and installation is easy with no drilling, soldering or computer modification needed. Also, for a limited time, all our modems come bundled with \$50.00 worth of free time on NewsNet!

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Q & A

There is a lack of consistency in the way power conditioner manufacturers rate their equipment.

Line filters aren't rated by any kind of power limits. They merely clean and smooth out the electricity that passes through.

Uninterruptable Power Supplies (UPSs) are another matter. Most are rated by the watts of power they can deliver for a specified period of time.

Kaypros have the following power consumptions: Floppy-based machines (any 2 or 4)—45 watts, Kaypro 10—80 watts, Kaypro 16—85 watts. Startup draw, the surge of current when you first turn them on, can be more than 140 percent of the above figures. If you plan on using a UPS, you should take the startup surge into consideration.

You would need at least a 65 watt UPS for a Kaypro 2 or 4. The startup surge for a Kaypro 10 can run as high as 120 watts. A UPS for the Kaypro 10 must be able to withstand this kind of draw without tripping a circuit breaker.

A good example is the UPS line from Cuesta Systems, Inc. Their 90 watt model will supply a Kaypro 2 or 4 for 15 to 20 minutes during a power failure and withstand the startup surge with capacity to spare. A Kaypro 10 or 16 would need the Cuesta 200 watt supply to withstand the startup surge. This model will supply a Kaypro 10 or 16 for about the same time that the smaller model will supply a Kaypro 2.

The question of response time

is nearly moot. The large power capacitors in the Kaypro power supply take longer to discharge than the slowest UPS needs to take over. This means that even without power protection, the discharging capacitors supply sufficient power for longer than it takes a UPS to switch itself in.

MBASIC puzzle

I have been having a problem that many Kaypro owners may be having. When I send a series of graphic escape sequences to the console from MBASIC, the console prints anomalous characters or commands at regular intervals. The following program is designed to fill the screen by drawing a series of vertical lines all across the screen:

```
10 Y1%=31:Y2%=131
20 FOR X1%=31 TO 131
30   X2%=X1%
40   PRINT CHR$(27) CHR$(76)
      CHR$(Y1%) CHR$(X1%)
      CHR$(Y2%) CHR$(X2%);
50 NEXT X1%
60 END
```

(Line 40 is broken into three lines for printing convenience. Ed.)

When the program is run, the console receives a line feed after every 16 lines so that each block of 16 lines is offset by one line. In other graphics programs various characters are printed at regular intervals. Is there any way to avoid this problem?

Thomas Savage
New Haven, Connecticut

You are running afoul of the line length limitation in MBASIC.

While MBASIC allows a maximum line length of 255 characters, the default width is 72.

At the end of line 40, you've used a semicolon to prevent the interpreter from inserting a CR LF sequence. The problem is that BASIC keeps track of how many characters you print on a logical line. When you exceed the maximum, either the default or that set with the WIDTH statement, the interpreter generates a line feed. It thinks it's doing you a favor.

In order to fool the interpreter, send something like a HOME CURSOR command, CHR\$(30), before reaching the maximum line length. This is a little cumbersome, but it's the only way I have gotten long graphics routines to work. Another thing to remember is that when you turn the Video mode on to use graphics characters, you are sending two bytes of information for each graphics character printed on the screen. The MBASIC interpreter counts each byte sent as one character printed.

DC powered Kaypro

I would like to run my Kaypro 2 on a 12 volt power supply during an upcoming trip. Can I expect any troubles using an AC to DC converter?

Michael Sample
Altamont, New York

Yes! It is doubtful that a power converter can deliver clean enough power for your Kaypro.

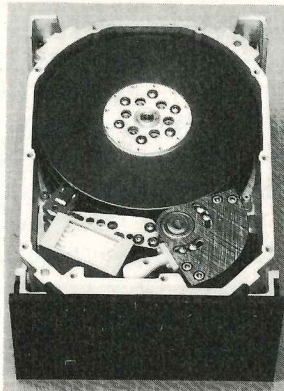
The only combination I can safely recommend is an Uninterruptable Power Supply, such

as the Cuesta or Gamma DC UPS. Both of these, as well as others, can hook into a 12 volt supply to extend their operating times. If the 12 volt system can supply enough current, you'll be able to use this combination for fulltime use.

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Editor's Notes



Kudos, uncommon Kaypros, and getting what you want

by Tom Foote

Ninety-nine percent of you who write direct your feedback to me or the editorial department. And we love it—the praise, the constructive criticism, and even the nastier remarks that catch us, now and then, “dead in the water” with things we wish we hadn’t done.

Yet four months of your letters show this trend: Most readers—who surely have never been editors (I was such a reader once)—innocently underestimate the big contributions an art department makes to a magazine.

Eric Mattei, art director, and Lorraine Leung, art assistant, deserve recognition, thanks, cold hard cash, and a year’s paid vacation—not only for enriching our work in the past, but, above all, for their class act in improving our look for the future.

In short, much of what you think about us is their doing, not ours. And it’s they who deserve a hefty share of the feedback we’re getting.

Why, sure, that’s a hint!

Unique applications of Kaypros

This issue covering the “Unique Applications of Kaypros” marks

the third in a series: in December/January we covered microcomputing tools (Christmas gifts); in February we discussed getting the know-how to use those tools (users’ groups, bulletin boards, public domain software); and now we present the remarkable things others are able to do when they combine tools, know-how, and—the fun part—ingenuity!

Humpbacks

In our cover story, Bill Lawton (who, incidentally, will soon appear with his Kaypro on nationwide television’s “PM Magazine”) reveals how he’s combined FBI fingerprint technology and whale-tail imaging on a Kaypro screen to help save the endangered humpbacked whale.

Speeches

Leon Fletcher, author of one of the most popular college textbooks on speech (*How to Design & Deliver a Speech, Third Edition*—Harper and Row), takes speech teaching one step further, revealing how he writes speeches on his Kaypro.

Applications smorgasbord

Mary DeDanan serves up a smorgasbord of uncommon Kaypro

applications, describing how Kaypros are used in (get this!): aiding Los Angeles Raiders victories, farming king crabs, finding mates for dogs, training dogs for the disabled, managing reindeer herds, researching brain tumors, predicting prisoner behavior and teaching them job skills, accessing data in the courtroom during arguments, reconstructing colonial homes at Williamsburg, distributing food to the hungry in Bolivia, assisting rural development in Kenya, monitoring elections in El Salvador, tracking the missing in Argentina, raising productivity in the Peoples’ Republic of China, and . . . more.

Farm fresh

Roger Weiss offers a farm-fresh smorgasbord of his own showing how Kaypros keep ‘em down on the farm by: controlling farm production devices like irrigation pumps, sprinklers, and feeders; collecting data via milk meters, infrared milk analyzers, soil-moisture probes, temperature gauges, and modems; computing optimum feed-mixes; and telecomputing to access commodities prices, livestock and crop research, weather forecasts,

marketing advice, and online farm software.

Jetsons are here

Jerry Houston details the slick tricks a Kaypro can do when connected to an analog-to-digital conversion and control system (ADC). According to Jerry, this nearly all-purpose workhorse can make your life like that of the Jetsons of cartoon fame—automatically controlling curtains, lawn moisture, heating, air conditioning, security devices, and household appliances—to say nothing of a wealth of industrial applications.

Responses to your responses

Back in November, we listed our tentative editorial themes and appealed to you to react to them. Though the overall response was . . . uh . . . underwhelming, those who wrote made excellent points—points that were not far from our perceptions of who you are and what you want from us.

We've run the salient suggestions in this issue's Letters column. And several patterns emerge.

What we hear

Though many say, "Keep up the good work!" we hear a scant few of you saying you don't want to see *PROFILES* cover topics of general interest to Kaypro users (e.g., famous Kaypro users, effects of micros on American life, and the future of microcomputing).

We hear hordes of you hollering, "Beginners need help, too!" along with, "What's going on at Kaypro?"

Above all, we hear you requesting more well-written "high utility" articles that help you squeeze the most from your machines—making your everyday work easier, if not more fun.

Such articles include software and hardware reviews and roundups; reviews of useful books, bulletin boards, and public domain software; articles rich with slick tips on using CP/M, the Perfect and MicroPro products, dBASE II, public domain utilities, all CP/M versions of BASIC, Turbo Pascal, and software specific to your profession (e.g., accounting, research, writing, screenwriting, telecomputing, farming and so on). We've sensed you've wanted the latter all along and that's what we want too—we who use Kaypros constantly in our work, we who want to enjoy seeing 'em produce just like you do.

Rest assured you'll get what you want. But . . .

All things to all people?

The point is, the way we intend to handle general interest material will help us meet our very real multiple objectives of pleasing all of our readers all of the time—a formidable challenge when they span the vast spectrums of experience, professions, and interests that you do.

Quite simply, our success lies in striking the balance you like, and getting your feedback when we don't.

Action taken

Efforts we've made to respond to your concerns include: developing a reader's survey that validates and fine tunes our picture of what you want; negotiating for

*. . . our success lies
in striking the
balance you like . . .*

In defense of a few good general interest articles

Surely general interest pieces may collide with our objective of delivering material of immediate practical value. Yet general interest articles do reach our beginners, whereas much of the practical writing does not. More important, the way we plan to deliver the few general interest pieces scheduled should offer lots to even our most ardent techies and utility freaks.

For example, though the piece on Tcimpidis's equipment seizure did not involve a single Kaypro, all indications are that our readers enjoyed seeing it in *PROFILES*. We expect similar reactions when William F. Buckley and Alvin Toffler appear in our April and May issues, respectively.

a regular column on what's going on at Kaypro; having Ted Silveira—hacker par excellence—do a user-friendly column on hacking tips; scheduling a regular columnist—user's group leader, Margot Wood—to handle the user's group column; replacing July's issue on the future of microcomputing with an issue filled with "Tools for Writers"; devoting September to "Education, Teaching, and Kids," October to "Business Applications"; and November to "Programming Languages."

OK?

FREE

CATALOG



KayPro Disk K1
Modem software

KayPro Disk K2
Utilities

Really oodles of spiffy little (and big) programs to help you get full use of your KayPro.

ZESOURCE.COM: A true Zilog format disassembler for 8080 and Z80 object (.COM) files. Now you can turn .COM files into .MAC files.

UNERA.COM: Simply enter "UNERA" followed by the name of the file you just erased and presto, the erased file is back! A lifesaver.

FINDBDS4.COM: Checks an entire disk, reports bad sectors, and then creates a special file containing those sectors. You save a bundle on disks.

CAT2: This a group of programs which create and maintain a single directory of all the programs you have on all your disks. Even keeps track of which programs are backed up and which aren't.

UNSPPOOL.COM: Use your KayPro II and print files at the same time. Doesn't slow down system response!

DUMPK, DU-77, COMPARE, SUPERSUB, FORM-FEED, DIR-DUMP, . . . and all have documentation on disk.

KayPro Disk K3
Games

KayPro Disk K4
Adventure

This disk contains one 191K game, Adventure. **ADV.COM:** This is the latest, greatest, most cussed adventure ever devised by half-mortals. This is the 550-point version so the cave is greatly expanded and the creatures are much smarter.

KayPro Disk K5
MX-80 Graphics

KayPro Disk K7
Small C Version 2 Compiler

KayPro Disk K9
ZCPR

KayPro Disk K11
Library & Checkbook Programs

CHECKS: This has been a very popular group of programs. Categorizes checks so you can keep track which are tax deductible and which get charged to which projects. Includes source and excellent example check files. Very powerful.

LIBR: This is a complete set of library routines which let you group files into a single file called a library. Then CP/M sees them as a single program, but with the library routines, you can list them out separately, run them separately, or divide them up again. Almost like a unix environment.

DISPLAY, VLIST, PGLST: Additional screen and print utilities.

KayPro Disk K12
FORTH

KayPro Disk K13
Source of fig-FORTH

KayPro Disk K14
Smartmodem Programs

KayPro Disk K15
Hard Disk Utilities

KayPro Disk K16
Pascal Compiler

KayPro Disk K17
Z80 Tools

KayPro Disk K18
System Diagnostics

Just as we finished editing the routines on this disk, we received a copy of KayPro's diagnostic disk. The memory test and drive exercise, routines on this disk are more powerful than KayPro's versions. (Plus, it's only \$12!) Setup for KayPro II and 4.

KayPro Disk K19
Prowriter Graphics

Kaypro Disk K20
Color Graphics Routines

Kaypro Disk K21
SBASIC Routines & Screen Dump

SBASIC: Finally a disk of SBASIC software. There are some good examples of structured programming on this disk (including one program written both ways so you can see the difference).

SCREEN DUMP: This is a screen dump for all Kaypro's new and old. You can buy a similar package elsewhere for \$60.

KAYPRO USERS DISKS

for Kaypro II, 4 and 10 \$12⁰⁰ each

Kaypro Disk K22
ZCPR (Again)

This disk is filled with ZPCR files. You get ZPCR for the Kaypro II, Kaypro 4, and the Kaypro 10. This version is fixed so that you can pass control characters (such as cntl-P) to the system and you can choose to have it recognize the semi-colon for drive select (as well as the colon). So you can enter "B;" or "B:" to select drive B. Super neat!

ZPCR, for those of you who don't know, makes CP/M a lot friendlier. It searches drive A for any .COM file it doesn't find on the current drive, the TYPE command scrolls text 24 lines at a time, and a new LST command outputs a file to the printer.

Kaypro Disk K23
Fast Terminal Software & New BYE

Kaypro Disk K24
MBASIC Games & Keyboard Translator

We sifted through many, many games before coming up with these gems. All will work on any Kaypro and all come in MBASIC source.

USOPEN shows you the fairway on the screen. You select the club and direction for each stroke. After you reach the green the display shifts to show details of the green and flag. For one to four players.

DUCK is an offshoot of aliens (pardon the pun). Hunter tries to shoot down ducks while ducks try to bomb the hunter. (Much fairer than real life.)

CASTLE is an adventure in which you select your attributes (strength, dexterity, and intelligence) and you get to purchase arms and protection. Great documentation and very interesting game.

KSTROKES is a keyboard translator similar to Smartkey. Bill Forbes did an excellent job creating this program. You can create and save translation files on disk. The program even includes a table which generates WordStar commands from the Kaypro's keypad! You can define 8 keystrokes at up to 63 characters each.

Kaypro Disk K25
Z80 Macro Assembler

Kaypro Disk K26
EPROM Programmer & Character Editor

Kaypro Disk K27
Typing Tutor

A complete typing tutor for beginners and experts. Written in Australia, it comes complete with source. This was customized for Kaypro II, 4 and 10 by Barry Cole of WLAKUG.

The documentation says you can learn to touch type in 8 hours (probably a little longer for mortals).

Kaypro Users Disk K28
Modem 730

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PRICELESS

MAGAZINE

Micro Cornucopia Magazine

Want to speed up your Kaypro? Want to find out what's going on under the hood? Want to know who's selling good products and providing good support (and who isn't)? Want to find really inexpensive software? Then you're in the right place.

Micro Cornucopia (Micro C) is the friendly journal for those of you who want to stay abreast of the latest information on Kaypros and other single board systems, or want to upgrade your Kaypro yourself without paying an arm and a leg. We have regular columns on Pascal, C, S-BASIC, FORTH as well as the popular "On Your Own" feature for those of you who plan to make the Kaypro your ticket to independence.

You can get all this and more when you order the special \$2.00 sample copy. In fact, you'll even find out how to turn a Kaypro II into a Kaypro 4 (or Kaypro 8).

Subscription Rates

1 yr. (6 issues - bulk rate)	\$16.00
1 yr. (6 issues - first class)	\$22.00
1 yr. (Canada & Mexico)	\$22.00
1 yr. (other foreign)	\$30.00

Schematic Packages

Finally, a complete schematic for your portable Kaypro, logically laid out on a single 24" by 36" sheet, plus a very complete illustrated Theory of Operation that's keyed to the schematic. You'll get detailed information on your processor board that's available nowhere else.

For instance, those of you with the 10 and new 84 systems get a thorough rundown on your video section complete with sample video control programs in assembly language and Pascal. Of course, all packages contain serial and parallel port details and programming examples as well as complete coverage of the processor, clock, I/O, and disk controller (information that is not even available in Kaypro's own Dealer Service Manual).

Kaypro Schematic Packages

Kaypro II & 4 (pre-B4)	\$20
Kaypro 10 (pre-B4)	\$20
Kaypro 84 series (II & 4)	\$20

All prices include postage.

Special Offer!

Your First Schematic Package (If you also order subscription) \$10



October 1984

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PRO-8 ROM PACKAGE

The PRO-8 package from Micro Cornucopia upgrades your Kaypro 4 (pre-B4) to a Kaypro 8 with 784K bytes (96 directory entries) per Tandem 100-4 (or equivalent) quad-density drive. Plus, you can select your own cursor character (and change it at will).



The package includes the new PRO-8 monitor ROM, a disk of formatters & copiers, and printed instructions. (We even tell you how to turn your Kaypro II into a Kaypro 4.) All you add is one or two double-sided double-density (390K), or double-sided quad-density (784K) drives. You get over 1.5 Megabytes on a two-drive quad-density system!

This new system can read, write and format Kaypro II and Kaypro 4 disks as well as Kaypro 8 disks. And it recognizes each disk type automatically!

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Watch Micro Cornucopia for more Kaypro compatibles. Call or write for information on the other Kaypro II and 4 ROMS from Micro Cornucopia.

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Up and Running

Succumbing to the lure of the classic computer game

by David Gerrold

All right, I confess, I admit it—I'll tell everything! Please don't make me watch any more "Ozzie and Harriet" reruns. I'll tell you everything you want to know. The plans for the Death Star are hidden inside R2-D2! Soylent Green is people! Rosebud is a sled! Spock's soul is trapped in McCoy's head, and I only bought a computer because I wanted to play "Adventure"!

There. It's out and I'm glad. I don't care who knows it any more. I bought my computer to play "Adventure." All that talk about word processing and checkbook balancing and mailing lists was only to justify the expense to my accountant and the IRS. So there! So what? So sue me.

Blame the New England Science Fiction Association, aka *Nesfa*. They did it to me. It's all their fault.

Let me explain. . . .

In the beginning

The *Nesfa* is a saner-than-average (this is not saying a lot) group of science fiction fans, located mostly in the Boston area. They are responsible for one of the very best annual regional gatherings of science fiction writers, artists and fans in the country—the

legendary *BOSKONE*, which is held every February and is highly recommended.

Many of the members of the *Nesfa* are students at the Massachusetts Institute of Technology. Many of them are computer hackers. (Are you beginning to see the connection?)

It started more than a decade ago. I thought I was attending a simple little science fiction convention. I thought I was talking to a group of people who would not significantly damage my mental health. We chatted about intelligent computers named Harlie and giant pink man-eating caterpillars and the glide ratios of super-heroes.

And then, innocuously, somebody asked, "David, have you ever played 'Adventure'?"

And I, hip deep in ignorance and naivete, blithely replied, "No. What's 'Adventure'?"

I was doomed.

Typewriters that talk back

They took me downstairs to a room where a terminal had been set up. Terminal?—you should pardon the expression. It was a huge teletype machine roughly the size and shape of Darth Vader. And every bit as friendly looking. It had a keyboard with 700 different symbols on the keytops, none of them in any known language,



and it clattered like a drunken linotypist.

If you have never in your life had the dubious pleasure of sitting down in front of one of these behemoths, then you have missed an experience roughly equivalent to having root canal surgery on a roller coaster.

Mind you—this was in the days when they still manufactured typewriters. This was in that prehistoric period when a typewriter with an electric cord extending out the back was considered an expensive (and probably frivolous) novelty. This was when a typewriter was expected to be a well-behaved machine that minded its own business, put words on the paper like it was supposed to *and did not talk back!*

To have a typewriter *literally* talk back was the kind of shock to my consciousness that has left me distrustful of most machines ever since. (I still talk to the can opener, but that's about it. The cat says it's okay.)

But getting back to the teletype. They told me it was connected via phone lines to the big mainframe computers at M.I.T. (I

didn't know what any of this meant at that time. I imagined 20 square miles of glimmering electronics—all underground, of course—a wall of flashing lights and glowing panels hidden behind thick Krell-metal doors, and the personality of Hal 9000.)

Playing the game

“‘Adventure’ is a computer game,” they explained. “You give the computer instructions. Here, just sit down in the chair and type. It tells you where you are and what’s happening. Don’t be afraid, David. Just sit down and type. You’ll get the hang of it real fast.”

Uh...

You are standing at the end of a road before a small brick building.

GO SOUTH.

They guided me through the first few moves of the game, showed me how to get into the cave, drop the rod, catch the bird, wave the rod, make the crystal bridge appear across the fissure—“Golly, I never saw that before,” said a voice behind me—and very quickly, I was lost. I never noticed when they all tiptoed out of the room. I was too busy taking my first trip deep into the Colossal Cave.

You are at one end of a vast hall stretching forward out of sight to the west. There are openings to either side. Nearby, a wide stone staircase leads downward. The hall is filled with wisps of white mist swaying to and fro almost as if alive. A cold wind blows up the staircase. There is a passage at the top of a dome behind you. There are bars of silver here! There are faint rustling noises from the darkness behind you.

GO WEST.

It’s like losing your virginity. You never forget your first time.

Thirteen hours later, as the rosy fingers of dawn crept across my haggard face, I was no closer to the end, but I was sure the cave was *real*—I had been there! I was still there, still wandering around, laden with bars of silver, precious coins, rare jewels, a Persian rug and a rusty axe. I and this clattering hunk of teletype machine had climbed, scrambled, tiptoed, and bludgeoned our way halfway to the bottom of Cthulhu’s basement.

I had been killed six times and reincarnated four. I had gotten lost in the maze three times and exhausted the batteries on my lamp twice. I had axed enough dwarves to crew a World War I submarine. I had killed a dragon with my bare hands and all I

and Woods more than a decade ago. The premise is simple. You are exploring the Colossal Cave, gathering up treasures, killing dwarves and dragons, puzzling your way through strange mazes—all for the privilege of solving the final mystery in the game: The Repository. In practice, playing the game all the way through to the end is something between an obsession and a career. People have been known to go into “Adventure” and not be heard from again for months—if at all! (I am not making this up.)

Managerial nuisance

During the 1970s, the “‘Adventure’ Phenomenon” was a persistent managerial nuisance in large companies. At that time,

Kaypro users have their choice of two terrific implementations of the game.

could think was, “If I just had a little more time, I could lick this thing. I know I could!”

When they came to lead me away from the machine, they said I was babbling, “I wonder how much a computer costs. I’ve got to have one of these in my home. . . .”

“Adventure” is the *classic* computer game.

It cannot be played except on a computer. It is available for most computers—and you have to play it to understand its appeal. It is the difference between being told about *Star Wars* and actually seeing *Star Wars*.

Origins

“Adventure” was written by a couple of fellows named Crowther

“Adventure” could only be played on a mainframe—and mainframe time was very expensive. You could tell when “Adventure” hit a company because its productivity would start to drop and computer time would become a scarcer-than-usual commodity. As fast as people discovered that the game was in the machine, they would start delving into it—and they would not stop until they had solved the game, even if it took months.

It did management no good to delete “Adventure” from the mainframe. Somebody always had a copy to put back in. The only cure was to let it die out naturally, a process that usually took about six months while everybody in the company

worked his way through the puzzle and solved it. Until a work force had completed its explorations of the Colossal Cave, you could not expect to get too much *serious* computing out of it.

Why I bought my computer

As I said above, "Adventure" is the real reason I bought a North Star Horizon way back in the Pleistocene of Microcomputing, 1978.

At that time, there wasn't any software for the S-100 machines. You had to write it yourself. Most machines had only 16k or 24k of memory. (I ordered my North Star with 64k of memory. I didn't know that was considered extravagant then.)

I said I was buying the machine to use as a word processor, but I already had a word processor, a Savin 900. (You can

see the last existing one of these on display in the Smithsonian, in the kerosene-powered word processor wing of the Science and Technology building.) I said I wanted to use the North Star for balancing my checkbook and getting my mailing list organized and learning how to program and all that other useful-sounding stuff.

Ha!

The truth was, I was waiting for "Adventure." It wasn't available yet, but I knew it would be. Even if I had to do it myself. I even started to learn how to program.

It was a couple more years before "Adventure" first showed up on microcomputers—a fellow named Chuck Crayne did it.

It was worth the wait.

"Adventure" on my micro

I took the phone off the hook, can-

celled the newspaper, told everybody I was going to be out of town for three weeks and fired up the trusty old North Star. Six weeks later, 30 pounds thinner, and a lot grayer at the temples, I staggered back out into the light, blinking and wheezing—but triumphant!

I had scored 350 points!

That "Adventure" ever made it to micros is a triumph of human determination over the limitations of the physical universe. It wasn't too long ago that one of those very knowledgeable, but unfortunately shortsighted, *serious* computer types went on at great length, listing all the reasons why "Adventure" could not be run on a micro. There simply wasn't the memory available. Micros weren't fast enough. Etcetera, etcetera.

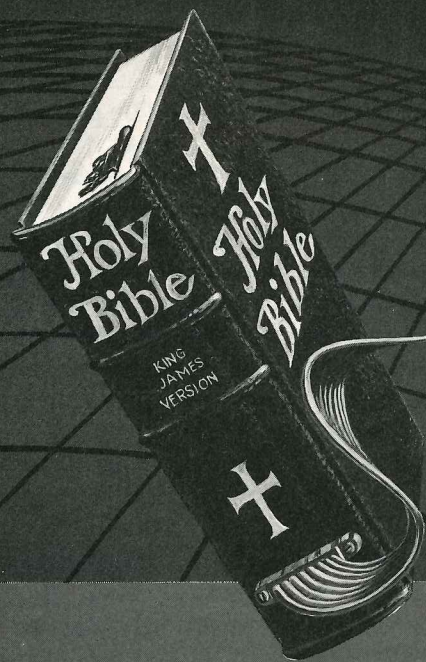
The more he talked, the more I was convinced that there had to be a way. Part of the solution was to increase the memory of the microcomputer to its maximum (64k), and the other part of the solution was to leave most of the game (that is, the room descriptions) on the disk drive and only retrieve the description of a room when you specifically need to see it on the screen of the computer.

Versions and availability

The original "Adventure" is in public domain. Implementations of it (most of which are *not* in public domain) have been written for just about every major operating system on the market. (I haven't seen a Mac "Adventure" yet. . . .)

Kaypro users have their choice of two terrific implementations of the game. Walt Bilofsky's Software Toolworks (15233 Ventura Blvd., Suite 118, Sherman Oaks, CA 91403) sells "Adventure" for \$19.95. Walt worked with Crowther and Woods, and this version is adapted from the origi-

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nal source code.

The original "Adventure" on CP/M is also available from Pat Lajko at C.D.E. Software, (2463 McCready Ave., Los Angeles, CA 90039), for \$15. This is the Chuck Crayne adaptation mentioned above. Crayne also had a copy of the original source code to work from. He wrote this in assembler, and it has the fastest response time I've ever seen in an adventure game.

Both implementations are faithful to the original. If you successfully complete Bilofsky's version, he'll send you a Certificate of Wizardness.

That brings me to Mike Goetz and *his* adaptation of "Adventure."

The original Crowther-Woods "Adventure" had 350 possible points and took months to solve.

Mike Goetz—one of those compulsive hackers who is not content to leave well enough alone—has expanded the Colossal Cave and added a lot of new rooms, treasures, and characters, thereby multiplying the number of problems to solve by the square root of Finagle. He has stayed true to the original vision of the game—in other words, it feels *right*—and now the total number of points possible in the game is 550!

Mike Goetz lives in secrecy these days because of the large number of employers, wives and children who have lost loved ones in the expanded Colossal Cave. Indeed, when you first boot the game up, if you listen very very hard, you can hear the still-echoing screams of anguish from the lost souls trapped within.

In other words, I do not yet know anyone who has played this version of "Adventure" all the way through to the end.

I haven't. I'm afraid to.

Mike Goetz has put his adaptation of the game into public domain, and I know of two or three software companies who have added it to their catalogs as a service.

Final notes

"Adventure" comes without documentation. You don't need it. You load the game, it asks you if you want instructions, it tells you as much as you need to know, and after that you're on your own. That's the point of it.

Okay—that's everything I know about "Adventure."

Don't say you haven't been warned.

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Free Lunch



A bouquet of word processing aids

by Dick Lutz

Everybody deals with text. Everybody. Even if the main use for your Kaypro is spreadsheets, programming, or even games, sooner or later you must edit words—words in a program, in a spreadsheet, or in a letter.

Most of your needs for handling text are no doubt satisfied by WordStar, Perfect Writer or whatever word processing program you normally use. But there are nagging annoyances:

The TYPE command won't display WordStar files properly—some characters keep showing up on the screen as graphic characters.

Even worse, TYPE can get ahead of you unless you're quick on the ^S (CTRL-S).

WC.COM, the word counting program that comes with The Word Plus, won't ignore dot command lines in WordStar files; you get seriously inflated counts if you have lots of dot command lines with comments.

WC does ignore numbers, but sometimes you want a word count that includes numbers.

If you move in and out of WordStar a lot, the most annoying seconds of your day can be the

wait during its sign-on screen and copyright notice.

Sooner or later, you run out of disk space—and the files you've archived are in danger of being erased because they just take up too much space.

Relief!

Take heart! There are public domain programs that relieve all these symptoms.

- ▶ TYPE109A is a substitute for CP/M's TYPE command.
- ▶ WSHOW is similar to TYPE109A and is specifically for WordStar files.
- ▶ SQ/USQ is a file squeezer and unsqueezer.
- ▶ SCRAMBLE does file encryption and decryption.
- ▶ LOCK/UNLOCK/MKEY is similar to SCRAMBLE, but less secure.
- ▶ WFAST16 speeds up WordStar's sign-on.
- ▶ WC1 is for word counting.
- ▶ CHGCHAR is a character-for-character substitution editor.

TYPE109A

This is a substitute for CP/M's built-in TYPE command. Renamed TYP.COM, it smoothly handles a variety of tasks for which the regular TYPE command just isn't suited. For one

thing, it displays WordStar files properly. For another, it pages screen by screen through a file—no more hair-trigger ^S. By adding a P to the end of your command line, (TYP FILE-NAME.XYZ P) you can also disable the paging if you like.

It will accept an ambiguous file name (afn) containing * and ? wildcards and will jump out of a file to the next when you hit ^X. It ignores *.COM files and others that don't display, so they won't splatter all over your screen.

What's more, TYPE109A accepts multiple filename specifications, such as TYP *.LTR BUDG*.084 MISC*.*. This saves you endless repetition when you're reviewing a lot of files.

Incidentally, there's another public domain program called WSHOW that solves the problem of viewing WordStar files, but that's about all it does. Until you have TYPE109A, you can get the same benefit with the command: PIP CRT:=FILENAME.XYZ[Z] The Z option strips off the high bits from the WordStar file.

Finally, TYPE109A will display squeezed files, automatically unsqueezing them on the fly.

SQ/USQ

SQ (for Squeeze) and its companion USQ or UNSQ (UNSQeeze) are great friends to modem users. These programs cut down the phone bills for downloading files from BBS or RCP/M systems and reduce the size of files archived. Without getting into unnecessary detail about how they do what they do, they work quite simply. The command: **SQ B:FILENAME.XYZ A:** creates a squeezed file called FILENAME.XQZ on drive A. The second letter of the filetype is changed to "Q" to indicate a squeezed file. Over a series of files, you can save up to 40 percent of file length, and it works on any file: text, data, or COM. Reversing the process is just as easy. The command: **USQ A:FILENAME.XQZ B:** unsqueezes the file and puts the unsqueezed copy on drive B.

SCRAMBLE

A file that's been processed by SQ is unreadable to mere mortals except with TYPE109A, USQ, or a version of SWEEP that handles unsqueezing. In a sense, it's a loose way of securing a file, because casual browsers can't easily pry into the contents of the file without knowing how to do it.

If you want real security, however, you need SCRAMBLE. The command: **SCRAMBLE FILENAME.XYZ CODEWORD** makes a file unreadable to anybody who doesn't know the CODEWORD, which can be any eight letters normally allowed in a file name. To unscramble the file, you repeat the same command again.

The level of security provided is remarkably high for such a simple (and quick) process. Scrambled files can be sent over phone lines or stored in the open with little worry that somebody

without the password will crack them. Furthermore, you can double-scramble files, first with one codeword and then another. Partners can actually hide a file's contents in such a way that both must do the unscrambling before the file can be read.

This may all sound like a Bondian fantasy, but there really are situations in which security of a file in an otherwise open environment is desirable. And yes—just in case you're wondering—you can SCRAMBLE a file, Squeeze it, store it or transmit it, then UnSQeeze it, and then unSCRAMBLE it, and it survives.

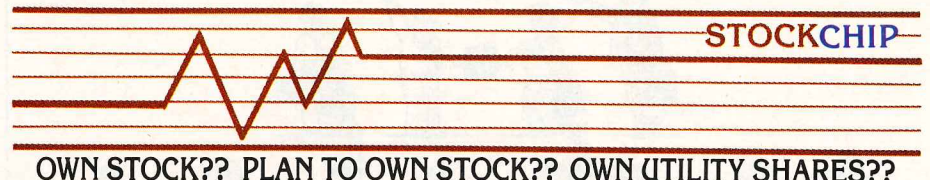
LOCK/UNLOCK/MKEY

Another group of programs works similarly. You can **LOCK FILENAME.XYZ CODEWORD** and later **UNLOCK FILENAME-**

.XYZ CODEWORD. This process works on COM files as well as text or data files. They yield only the words "locked file" if they're accessed. But LOCK/UNLOCK isn't as secure as SCRAMBLE because the command **MKEY FILENAME.XYZ** yields up the codeword. This means the security of a locked file hinges solely on the security of the place where you keep MKEY. Anybody with access to MKEY and UNLOCK has access to your locked files.

WSFAST16

What about WordStar 3.3's annoyingly long sign-on? You're right if you suspected a timing loop rather than something attributable to the loading of the program. A group of programs called WSFAST16 neatly beats



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this problem—and does it quite automatically.

Being sure that you've retained a safe copy of your fully installed WordStar, all you need do is bunch the WSFAST16 group of files on a diskette with your own copy of DDT and WS.COM. Using

EX.COM, a public domain substitute for SUBMIT (provided with the package), issue the command: **EX WSFAST16** and very shortly you have a revision called WSX.COM. It comes up a lot faster, leaves the bare bones of your serial number and copy-

right notice intact, and eliminates most of the wait for WordStar.

CHGCHAR

Suppose you want to change one character to another throughout a file—a long file. It can happen, for example, when you want to delete unwanted hard carriage returns from a WordStar file in order to reformat it.

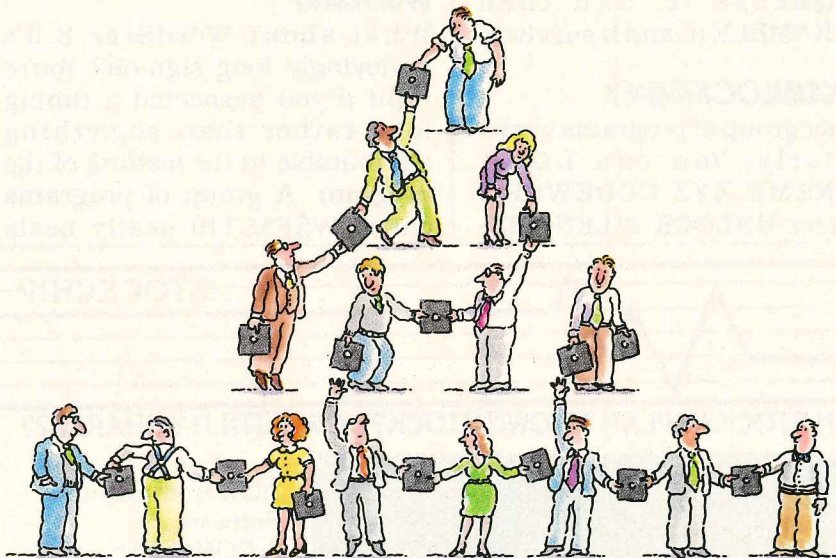
Carriage returns are ODOA in hexadecimal, and if you replace every OD with a @ and do the same with every OA, you can then replace them with carriage returns where you want them, and then reformat. You get started this way: **CHGCHAR FILENAME.TYP OD#40 CHGCHAR FILENAME.TYP OA#40**. Hexadecimal 40 is the @.

CHGCHAR also changes one capital letter for another, as in **CHGCHAR FILENAME.TYP A>B**. But to deal with lower-case letters, you must use their hex equivalents, found in any good ASCII chart. That's because if you type them into a CP/M command line, CP/M translates them to upper case before it does anything else.

WCI

The Word Plus's WC (WordCount) program isn't smart enough to ignore WordStar text lines that begin with periods—i.e., dot commands. It is smart enough to ignore numbers, but you can't turn that feature off. WCI, a public domain word counting program, does ignore dot commands, and does count numbers—things like (#1) or 35. It makes a good supplement to the word counting program supplied with your Kaypro. □

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Finally there's a foolproof way to protect software against unauthorized duplication. And the technology is all on the disk itself.

The new Prolok™ disk doesn't need add-on hardware. Instead each diskette is marked with a unique, physical "fingerprint." No two are alike. A precise description of the individual print is encoded magnetically. The fingerprint AND the description must match exactly before the software is decrypted and released to the system. No match, no access.

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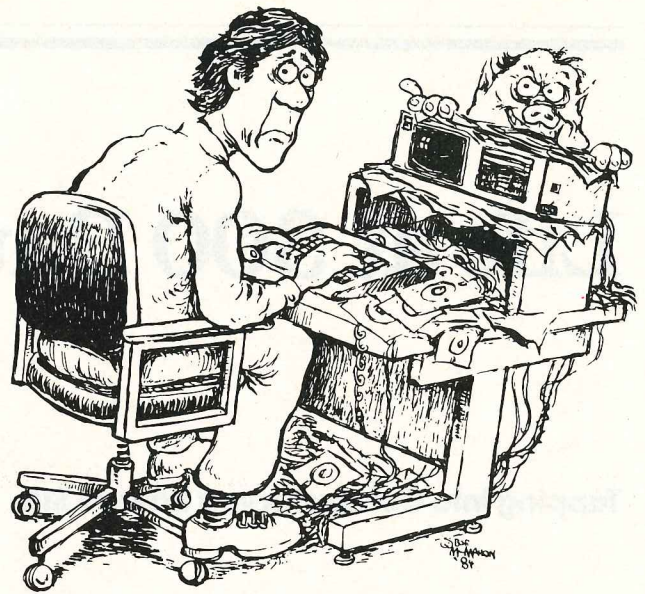


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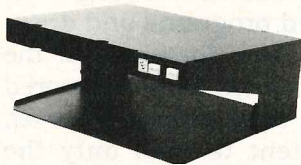


Porta-Enemy No. 1



D.M. aka Deskus Messus

His M.O. is to clutter your desk with diskettes and paper to the point where you can't find anything.



The **Porta-Micro Mate** (also known as the PMM) stores up to 20 of your most commonly used diskettes in the included plastic library boxes, as well as the keyboard, under the computer saving 1/3 of your desk space. The PMM's new sturdy steel base holds any transportable to a comfortable viewing angle.

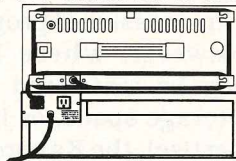


DEALER INQUIRIES INVITED

Porta-Enemy No. 2

S.C. aka Switchus Contortium

A dangerous M.O. in that everyday when you come in to turn on your computer and printer, you must lean over in a contortionistic fashion to find the switches to both units.

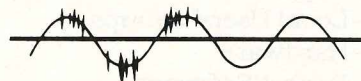


Two rear mounted power sockets allow you to plug-in both your computer and printer with just one wall connection.

Porta Enemy No. 3

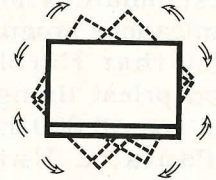
S.G. aka Surgus Glitchem

The most dangerous of the three evils, S.G. can do the most damage, that's because a spike of electricity can be sent across the power line and *Strike* your computer when it's on.



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Life at 300 Baud

Tapping into CompuServe's Kaypro SIG

by Brock Meeks

Last night Harold met with Paula to discuss the newest modification of the communications program MEX.

Forget that Harold is an ordained priest living in New England, some 3,000 miles away from Paula, a University researcher in California.

Forget that 95 other people "listened in," and that Harold and Paula will never know exactly how many people eavesdropped on their conversation.

Forget all the above because they are neither strange nor unique to CompuServe's Kaypro SIG (Special Interest Group), the electronic meeting place of the world's largest Kaypro users' group.

CompuServe is a commercial information service that is home for hundreds of specialized databases and SIGS. Its Kaypro SIG is a popular forum for discussing any aspect of the Kaypro—from basic "how-to-operate" information to technical talk about I/O port addressability with ZCPR installed. This forum is always open—as in 24 hours a day, 365 days a year (with reduced admission rates at night) and can be reached from almost anywhere in the world.

As one of the many SIGS in CompuServe's Personal Computing area, the Kaypro SIG serves

as an extension of a worldwide 16,000-member Kaypro Users' Group based in New York. Combine that membership with all current and potential CompuServe users and the numbers become stunning.

The Kaypro SIG is unique because it can be "everywhere and anywhere" to so many. Most KUGs have local BBSs that they can call to get advice and maybe download an occasional program or two. However, where local boards may be restricted (typically by storage space, or just a lack of expertise), the Kaypro SIG thrives on its access to the extensive knowledge of a worldwide membership.

If you have a problem, someone in the world has probably solved it long ago. More than likely you'll find the solution amid the SIG's message traffic. (Hence the value of allowing "eavesdropping" on conversations.)

Message sections

The Kaypro SIG has nine different message sections, each supporting the following topics:

- 0—General
- 1—Utilities/Communications
- 2—Kugram
- 3—Local Users' Groups
- 4—Hardware
- 5—Perfect Software
- 6—Free Software
- 7—dBASE, Turbo+



8—Star Software

Within each message base is also a database containing user-contributed programs and documentation files. Members of the SIG have access to all its stored programs. Most people, however, seem content to read only the message traffic, without ever bothering to download.

The Kaypro SIG's database section is called "Ex Access" (XA) and is completely separate from the message base. Programs appear in non-overlapping topic sections; e.g., if you want a new communications program, you'll find it in the Utilities/Communication section—not the Hardware section.

The General message base is a catch-all containing topics not directly covered elsewhere, such as initial appeals for information and "all calls" for help.

The Utilities/Communication section deals with the use (and abuse) of public domain utilities and, more frequently, lively discussions about telecommunicating with a Kaypro. (If you thought you were the only one having

trouble "hooking in," this section should help.)

The Kugram section offers online copies of current and previous newsletter issues, along with editorial comments and readership feedback.

Within their own section of the Kaypro SIG, local users' groups post information. However, at the time of this writing, this section was not very active.

Hardware, the "nuts and bolts" section, is where to go if you are electronically inclined or have a particular hardware problem. (I raced through this section when my dealer couldn't resolve a heat-related drive problem. Result? A reply and a solution in 24 hours.)

Contained in the Perfect Software section are all the frustrations and triumphs of the legions who have gone before you in search of the "perfect" answer. And the Star Software section, like the Perfect section, contains discussion about MicroPro's "Star" programs—WordStar, DataStar, ReportStar, etc.

The Free Software section offers just that: public domain software free for the taking—though you still have to pay CompuServe for online time. And the dBASE/Turbo+ section holds numerous user-contributed programs, tools, and discussions involving dBASE II and Turbo Pascal.

The SIG's "real time" conferencing allows many people to take part in online discussion. This is a great tool for disseminating information quickly and for bringing people together who otherwise might never meet.

Getting your foot in the door

Gaining access to CompuServe is simple. You need a modem, a communications program, your

Kaypro, and a subscription to the CompuServe service. Your initial subscription can be obtained through most software stores and costs around \$40. Included in the price is five hours of free online time—a \$30 value—and your CompuServe ID number and password. Once you have all this, you can immediately enter CompuServe and join the Kaypro SIG.

Guided tour

CompuServe is fond of menus. If you let the system have its way, it will present you with enough menus to make you curse the term "user-friendly." Though this hand-holding will get you where

The roundabout way to the Kaypro SIG is to choose number 3 (Personal Computing). This method gets you there, but you feel somewhat as if the "taxi driver" has taken you for an unintended ride. You will encounter at least three other menus before reaching the SIG.

It's more efficient to simply enter the command `g pcs25` at the `!` prompt. This shortcut tells CompuServe you know the "address" of the place you want to go. CompuServe will, in turn, search for the address and rush you directly to the Kaypro SIG, without a single intermediary menu.

CompuServe has the ability to read what it calls "message threads."

you want to go, once you're there, you're pretty much on your own.

When first presented, the CompuServe main menu options look pretty ambiguous—like this:

CompuServe Page CIS-1

CompuServe Information Service

- 1—Home Services
- 2—Business & Financial
- 3—Personal Computing
- 4—Services for Professionals
- 5—The Electronic Mall(™)
- 6—User Information
- 7—Index

Enter your selection number, or H for more information.

!

The `!` is CompuServe's command prompt. Any time you see it, CompuServe expects input from you.

Step on in

Once inside the SIG for the first time, you'll be asked to do some "paperwork." First you'll be asked if you want to join. Joining doesn't cost you anything—it actually saves you money. It adds you to the users log and enables the system to recognize you. It also allows the SIG to keep track of how many messages you have picked up and how many you have received since you last logged on.

The first Kaypro SIG menu looks like this:

Kaypro Users' Group
Function menu:

- 1 (L) Leave a message
- 2 (R) Read messages
- 3 (RN) Read new messages
- 5 (B) Read bulletins
- 6 (CO) Online conference

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KAYPRO 4-84

At last, the real time clock in the 4-84 IS good for something — the complete TIMEPRO system is available as single programs, or as a complete set:

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- 9 (OP) Change your SIG options
- 0 (E) Exit from this SIG

Enter selection or H for help:

Just what all these options do is self-explanatory; however, trying to figure out precisely how they work can be confusing. Fortunately the HELP files are extensive, if a bit wordy. At 300 baud the time adds up quickly, so I would suggest just learning how to read messages (R) and leave messages (L) at first.

To start reading messages, select number 2 from the above menu. You will then be given the current range of message numbers and asked to choose a starting point. Starting at the lowest number and working your way up nets you one of two results.

First, you may become extremely bored by all the messages that are irrelevant to your situation, in which case you may turn your attention elsewhere and miss the full potential of the message base. Second, you could become fascinated by the numbers of people having the same problems you are. If this happens, you may spend so much time wading through message traffic that your CompuServe bill may resemble your mortgage payment.

The scan command

The scan command solves both of the above problems. "But where is the Scan command on the menu?" you ask. Good question. It's not there. You can use it, however, by entering **S** at the function menu instead of a 2. The system will reply with <F>orward, <R>everse, or <A>bort.

Here you can scan all messages, starting with the oldest message on the system (forward scan), or see the most current messages first (reverse scan).

Either choice presents you with each message's number, a subject header, who the message is from, and who it is for.

Scanning the message base will allow you to pick the message descriptions that seem appealing. You simply write down the assigned numbers of the messages you want to read later. If the screen is scrolling by too fast, hit a ^S to pause. Once you've written the numbers down, ^Q will start the display moving again.

Be forewarned that scanning can present a problem of its own: multiple messages on the same topic. This too has a handy solution.

Threading your way through

Fortunately CompuServe allows you to read what it calls "message threads"—strings of messages on the same topic. For example, say one person is having a problem with the auto-dial feature of SuprTerm (sound familiar?) and enters a message requesting help. The message thread would contain all the responses he received on his request for information.

Once you have located a message that looks interesting, you can call it up from the message base with the (R)ead command (from the Function Menu). After you have read the message you will be given the following options:

Read Option Menu:

- 1 (UA) Use address to send
- 2 (RE) Reply to current message
- 3 (T) Return to Function Menu

Enter selection or H for help:

Entering an H will give you background on what can occur when responding to a message and how to read the reply to that particular message. However, we want to read the entire message thread, not just the reply. Again

CompuServe is silent on this option. To read the thread of a message, enter **RT** (Read Thread) instead of one of the three choices presented. The system will then search for the earliest message on the subject and take you completely through the discussion, without your having to enter anything more complicated than a carriage return.

Adding your two cents' worth

If you want to initiate a discussion, or are leaving a note to someone, just choose number 1 (L) from the function menu.

Next, you are asked the subject of your message and who it is for. After answering you may enter your text. Text can be typed online, or uploaded from text prepared on your word processor. (I have uploaded ASCII text files with SuprTerm, MEX, and Modem714, all without any problems.)

Once your message is complete, you must choose a section in which to "store" it. For example, to store a message in the General category, you would choose section 0. The prompt to store messages looks like this:

Leave options:

- 1 (S) Store the message
- 2 (SU) Store Unformatted
- 3 (C) Continue entering text
- 4 (A) Abort the Leave function
- 5 (L) List the message
- 6 (R) Replace a line
- 7 (D) Delete a line

Enter selection or H for help:

I always use option 2, Store Unformatted, because I don't trust CompuServe with reformatting what I have been careful to format my way.

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The database sections of "What's

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300 BAUD

in the fridge?" are like your parents refrigerator; you can always count on the usual things, but there's always the chance you'll see something new.

In some of the databases, you will recognize the standard CP/M public domain programs. But with CompuServe's heavy use, you never know when people will upload programs—and they're yours for the taking.

Manipulating the database section is complicated and therefore underutilized. However, the bulletin (B) from the function menu offers a good overview of the downloading/uploading procedures, and once inside a particular section, you can ask for help (H) on any item.

When reading any of the help menus on CompuServe (or anywhere, for that matter), make sure you have opened a buffer to capture all that is scrolling across your screen—you'll feel a lot better about yourself (and the time and money you spent) in the morning.

Come again

Although local users' groups are a great source of information and emotional support, few can match the power, timeliness, and always-available fun of the CompuServe Kaypro SIG. For all its vastness, the Kaypro SIG has a "homey" feel to it. And after regularly contributing to the discussions and downloading your share of free programs, you'll feel at ease in using it.

Knowing you can reach out and tap a world of knowledgeable Kaypro users is exciting. Indeed, asking a simple question and receiving a torrent of replies does something to you—it makes you feel like part of a much bigger electronic family. And isn't that what telecommunications on microcomputers is all about?

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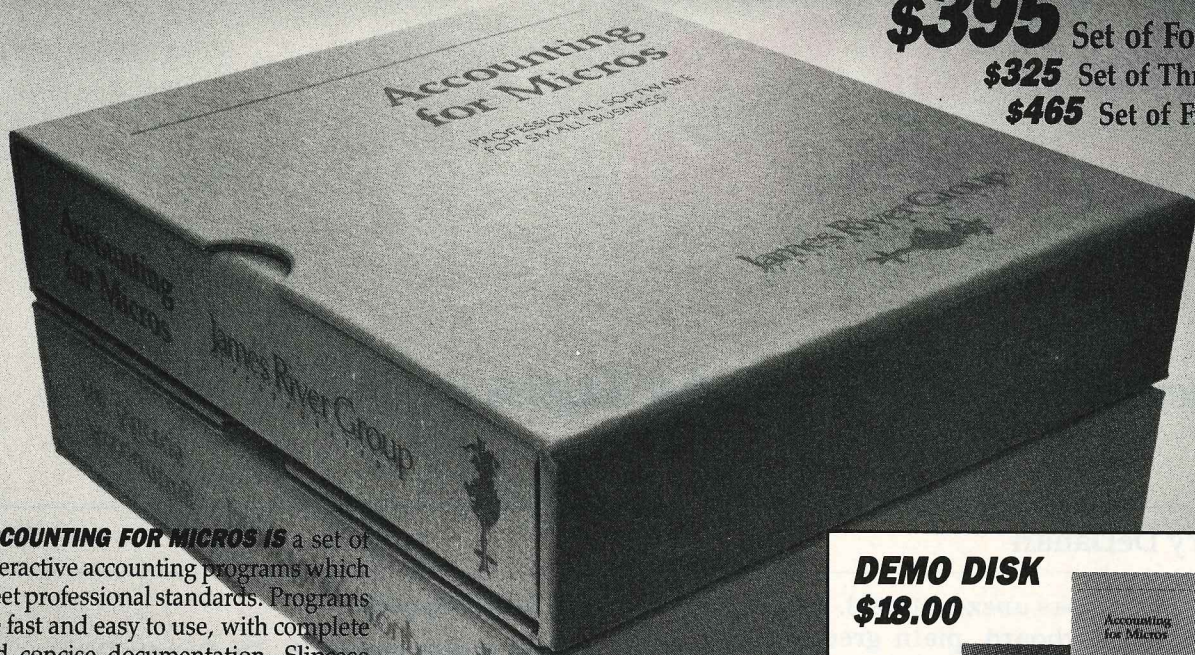
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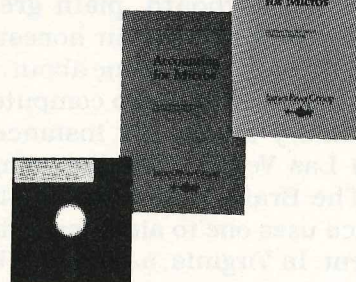
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Tales of the Unexpected

A believe-it-or-not potpourri of what Kaypros are up to

by Mary DeDanan

It certainly looks unexceptional. Squat gray box, standard keyboard, plain green screen, utilitarian disk drives—an honest value, yes, but really nothing to telex home about.

Yet the ordinary Kaypro computer is doing many extraordinary things. For instance, a Kaypro is at work in Las Vegas, “handicapping the handicappers.” The Brain Tumor Research Center in San Francisco uses one to aid in essential research and treatment. In Virginia, a Kaypro is busy with a computer dating service—for dogs. And a prison psychologist in California uses hers for a project that may eventually predict prisoner behavior—inside and outside of jail.

“A Kaypro’s got more applications than you can shake a joystick at,” said Jak Perham, technical liaison at the Kaypro plant in California. “It’s just amazing what the human imagination can come up with, and what the microcomputer can accomplish.”

Handicapping the handicappers. Before you put your money on the betting counter, wouldn’t you like to know if the given odds were accurate? People in Las Vegas do. That’s why Marty Mendelsohn and John Hodges run the American Association of Documented Sports Services (AADSS). Using their Kaypro computer, Mendelsohn and Hodges keep track of more than 150 professional sports handicappers who belong to the AADSS. “Each service claims that it’s the best. But who really is?” said Mendelsohn. To find out, the two analyze their members’ win/loss percentage, and the ratio of money earned to money bet on professional and college sports, such as baseball, football, basketball, and hockey. In fact, with the help of the Kaypro, the AADSS is becoming known as the “handicapper of

the handicappers.”

Brain tumor research. Dr. Dennis Deen is a principal researcher at the Brain Tumor Research Center at the University of California at San Francisco, an institute investigating the causes and treatment of this rare and mysterious disease. The Brain Tumor Research Center is the only facility of its kind in the United States and treats more than 300 patients a year. Dr. Deen uses his Kaypro 4 in compiling data, writing scientific papers, and putting together grant requests. “The Kaypro allows me to bypass my secretary and do my own writing,” said Deen. “That saves hours and hours of work.”

Computerized dog breeding. Tri-State K-9 Service in Arlington, Virginia, uses a Kaypro 4 to match desired characteristics for canines, such as breed, bloodlines, color, physical features, and, of course, sex. Dog owners then receive a list of dogs in their area with the desired attributes. This computerized dog mating service is believed to be the only one of its kind in the country, although at least one similar system is being used for racehorse breeding.

Predicting prisoner behavior. Dr. Lois Shaver, a staff psychologist at the Vacaville State Prison in California, is using a Kaypro 10 for an ambitious project to research and predict prisoner behavior. Currently, Shaver is building a database by studying 500 inmates and keeping tabs on their work performance, peer interaction, educational motivation, and how well they cooperate with the correctional system. She then uses this data to help prison officials decide which inmates are good candidates for transfer to another section or a different work assignment, or for parole. As her database grows, Shaver wants to actually predict prisoner behavior.

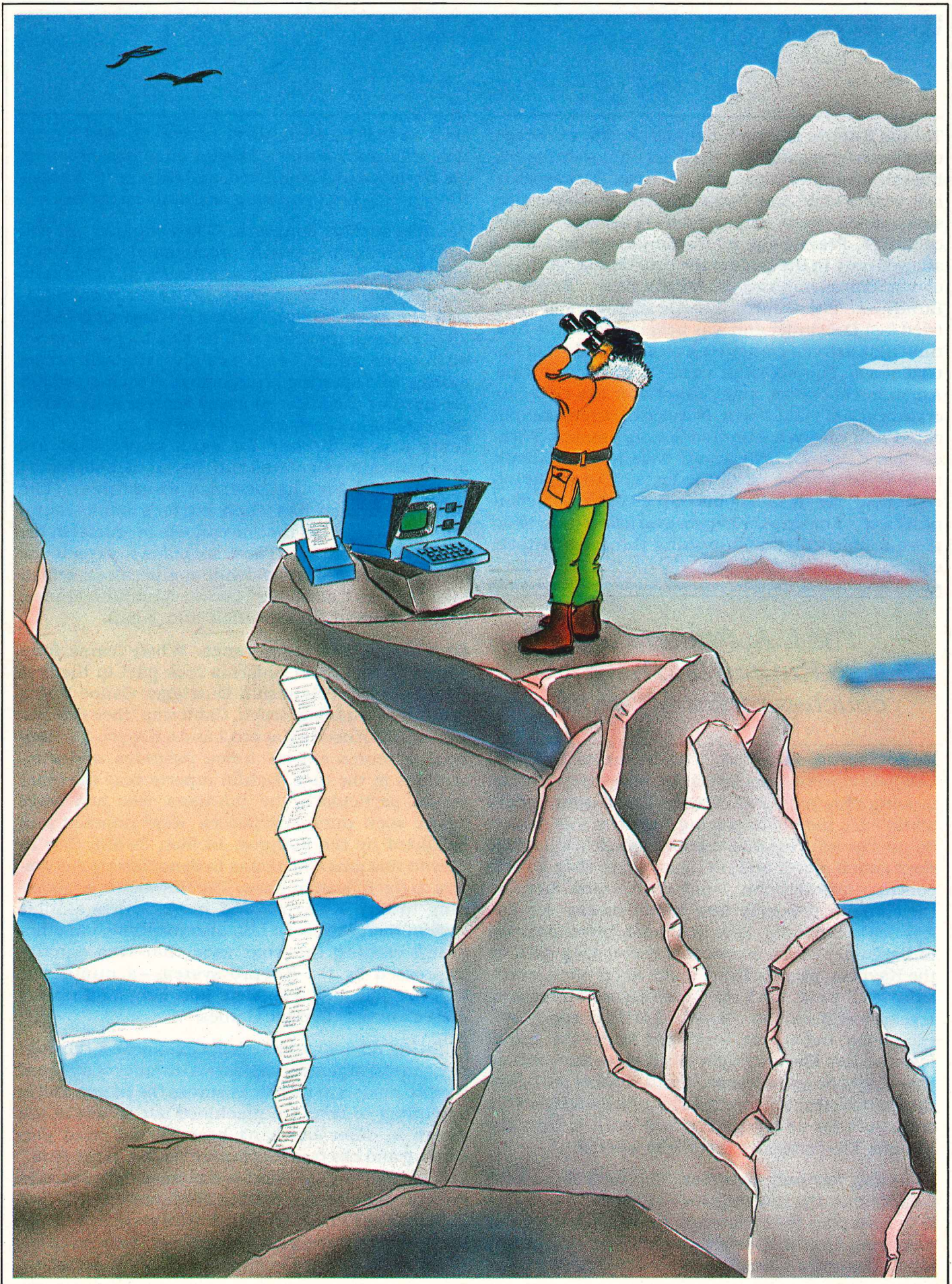


ILLUSTRATION BY DAVID GRIMM

Taking Kaypro to court. Kenneth North, a Chicago trial lawyer, recently won his legal fight to bring his Kaypro computer into court. In early December of last year, a state trial judge granted North permission to use a microcomputer during adversarial proceedings. Previously, microcomputers had been allowed only in the halls of the courthouse, or in the courtroom during recess. North's case, "Edgar C. Bundy vs. The Church League of America," was tried last December and was believed to be the first time that use of a computer was allowed during the trial itself. The six-week case "... involved First Amendment issues, and control over the religious organization," said North. It was extremely complicated and involved hundreds of documents. Without his Kaypro, North would have had a difficult time keeping track of all the facts. "I'm exploring right now," North said of his in-the-courtroom computer use. "I'm sure the people who follow me will do more sophisticated and exciting things with their computers."

The L.A. Raiders use a Kaypro II to help coaches make decisions.

Negotiating salaries. The National Football League's Players Association, i.e., the players' union, is using a Kaypro 2 and a Kaypro 10 to assemble data about each member's playing statistics and salary/bonus figures. This information is made available to the football player and his agent when they go into contract negotiations. Since each union member then knows precisely how much money his colleagues are making, he is in a much better position to bargain. "Before we started correlating data on the Kaypros, players didn't really know each other's salaries," said Michael Duberstein, director of research at the union. "We could call somebody over the phone, but it was very hard to get the actual information. Players might forget some part of it, or they might be embarrassed to tell another part. Now the union collects salary information directly off the contracts for every player and puts it into the Kaypro. The computers are really a benefit."

Planning football victories. The 1983 Superbowl Champions, the Los Angeles Raiders, use a Kaypro II to help plan their victories. Coaches extract raw data from films of their rivals, studying each team's strategies and choice of plays for different variables,

such as ball position, down, coverage, and formation. Information and statistics on opposing teams are compiled and organized, and then used to assist Raiders coaches in making decisions on the field.

Scoring surfing contests. "The computer age will help each surfing event's promotional effort," said Ian Cairns, president of the National Scholastic Surfing Association (NSSA) and its sister organization, the Association of Surfing Professionals (ASP). "But I believe the effect will be way bigger than we all imagine, and will be the catalyst that will propel surfing into sporting prominence." Two Kaypro 10's are used by the NSSA to assist scorekeepers in rating surfing contestants in some 90 amateur contests a year. Scores for each contestant are automatically calculated and displayed, both for the judges and for the contest announcer. The announcer also has each surfer's background online, information that he can use to entertain the crowd between trials. There are plans to expand the system to the ASP's worldwide competitions, which take place in California, Hawaii, Australia, France, England, Brazil, South Africa, and Japan.

Organizing outrigger races. When teams from Tahiti, Hawaii and California took part in the first World Classic Polynesian Outrigger Canoe Races last August in Long Beach, California, race director Chris Dahlin used a Kaypro 2 and a Kaypro 4 to keep track of scores, entries, times, positions, and eliminations in the race. Dahlin reports that the other teams, particularly the Tahitians, who had never before seen microcomputers, were amazed and delighted by the Kaypros. In fact, Dahlin flew to Hawaii this past Christmas to demonstrate the system to the Hawaiian team. The Hawaiians are planning to buy a Kaypro and implement a similar system themselves. Dahlin also mentioned another group visiting the boat race that was equally impressed by the Kaypro system—a number of Olympic officials, who were just wrapping up the 1984 Summer Olympic Games.

Fighting ecological battles. Greenpeace, the ecology activist organization, uses a number of different Kaypro models in its offices across the nation and is beginning to take the machines out to where the action is. "You just can't beat 'em for word processing and electronic communication in the field," said Michael Bailey, veteran of many whale, seal and dolphin preservation battles, of his battered Kaypro II. "As far as I'm concerned, they're standard equipment on my campaigns from now on." This year, Don White of the Hawaii Greenpeace office will be taking

a 2X on the Greenpeace flagship *Rainbow Warrior* for word processing, recordkeeping, and land-to-sea communications.

Navigating by Kaypro. The phrase "you're never lost with a Kaypro" takes on new meaning when you're in a boat in the middle of the ocean, relying on a Kaypro to steer you in the right direction. The Eco System Company of Encinitas, California, puts Kaypro 2's in different boxes with three-inch hard disks and two-and-a-half-inch printers, and programs them to run navigation systems for boats. The machine, called the Eco-Nav-2, sells for \$7,900. Reports Neil Marshall of Eco System, "It still operates like a Kaypro, but yes, it looks entirely different."

Checking weather forecasts. Three young people—Joseph Lang, who is blind; Stephen Ryan, who has cerebral palsy, and Iris Shockley, confined to a wheelchair due to cerebellar atrophy—are using a Kaypro 10 to compare the accuracy of experimental computer-generated weather forecasts with conventional forecasts. The three are programming interns and are working at the National Weather Service in Silver Spring, Maryland. The Federal Aviation Administration is interested in the project and may soon provide minute-by-minute automated forecasts to aircraft in flight, thanks to the verification work done by these three.

Training dogs for the disabled. In Santa Rosa, California, an organization called Canine Companions for Independence uses three Kaypro 2's to help train social, signal, and service dogs for the disabled. "We not only serve the disabled clientele, but unlike many service organizations, we also employ them," said Bonita Bergin, executive director of CCI. The group's computers are particularly important to the handicapped employees of CCI, allowing them rapid access to files and documents. Previously, this required more physical strength in arms and legs than disabled employees possessed.

Translating the Bible. Two Kaypro 10's are helping the blind to read the Bible in Korea and the Philippines. Rich Clingman of the United World Mission has produced a program that translates typed text into braille. The Kaypro then reads the text diskettes and interfaces with a braille printer to drive a plate maker. "Previously, our staff received braille manuscripts and duplicated the braille by hand," said Clingman.

Tropical botanical research. Fully one-quarter of all plant, insect, and animal species will disappear

from the earth within 30 years, according to Peter Raven, director of the Missouri Botanical Garden in St. Louis. The Missouri Botanical Garden has one of the world's largest and most active programs of tropical botanical research. Assisting in categorizing jungle flora before it is gone are ten Kaypro 2's, eight of which are used in field locations in Peru, Bolivia, Cameroon, Madagascar, New Caledonia, Panama, Costa Rica, and Nicaragua. Another machine is used for short-term field trips in Central and South America and in Africa, and the last remains in Mis-

*Kaypros assist in
categorizing tropical
jungle flora in Peru,
Madagascar, Nicaragua, etc.*

souri, to download the gathered data into the main-frame computer.

"Having a Kaypro 2 integrated into each of our foreign research programs is fantastic, allowing us to both databank and analyze various kinds of field data on the spot," said Raven. "Kaypro computers in the field greatly speed [the process of] making the critical specimens available sooner to researchers around the world." Kaypros are employed by the botanical collector to enter field notes and by individual curators and collectors to coordinate data and to keep detailed records on the plants in their area of expertise. The Botanical Garden adds about 100,000 new plant specimens (mostly tropical) to its collection each year.

Improving learning potential. Is the process of learning a skill unto itself? The people at SuperCamp think so. "Our techniques can improve a youngster's learning potential by five to 50 times," said SuperCamp co-founder Bobbi DePorter. The organization uses 30 Kaypro computers in the accelerated learning skills program in Bear Valley, California, and Burlington, Vermont. For 12 days teenagers concentrate on an intensive course in memory training, note-taking, test-taking, vocabulary building, speed reading, and S.A.T. (Scholastic Aptitude Test) preparation. Perhaps most importantly, students build self-esteem and self-confidence through the program—helped, no doubt, by the simplicity of the computers they use.

Monitoring surgical patients. "American hospi-

tals are trying to improve care and hold down costs," said Bill Mabee, a certified registered nurse-anesthetist in Edmore, Michigan. Mabee's Kaypro 2 is helping in that goal. "The Kaypro is portable, functional, relatively inexpensive, and lends itself to use in hospital settings." Mabee has modified his computer to communicate and interact with various peripheral medical devices used to track the status of a patient undergoing surgery. "The Kaypro 2 plays a central role in it," said Mabee. "The net result is that we can generate an anesthesia record or a critical care record instantly." Mabee is currently working on marketing his modified Kaypros to operating rooms in hospitals everywhere.

Archaeological record keeping. Two Kaypros are part of the Galway Project on the Caribbean island of Montserrat. The versatility of the multipurpose machines fits in nicely with the many facets of the project. The computers are used for project coordination, career training for area residents, some economic development of the island, and for maintaining records and inventories at more than 50 archaeological sites, helping researchers to evaluate their cultural significance.

Researching Mayan civilization. Robert Case, an anthropology lecturer at San Diego State University, is in the middle of a three-year research project on the rise and fall of the pre-Columbian Mayan civilization. Using a "climate-hardened" (specially sealed) Kaypro 10 for field work and a Kaypro 4 for backup and additional data entry at campsite, Case is working in southern Mexico and north Central America, successfully battling daily temperatures in the mid-90s, with about equal humidity levels. Said Case of his Kaypros, "As a planning tool, the computer permits the project staff and resources to be utilized to maximum potential."

Distributing food. Well over 10,000 metric tons of food has been distributed in Bolivia with the help of a Kaypro computer. In La Paz, Bolivia, a group called Food for the Hungry is using its Kaypro 2 to track food supplies, shipments, and distribution. Food for the Hungry estimates that one million Bolivians face the possibility of famine. The danger is particularly acute for the Aymara Indian people in the Altiplano in the harsh Andes mountains and the Quechua people of the rural valleys.

Developing rural Kenya. Kenya's Ministry of Finance and Planning has been working for the last eight years to develop the country's rural districts and decentralize the government. Seven Kaypro 2's and three Kaypro 10's are streamlining the process

with easy-to-use spreadsheet financial analysis, word processing, and data management programs. The Kaypros are valued for their portability and ruggedness in a rugged countryside. In fact, because of its positive experiences with Kaypros, the Kenyan government recently lifted its restrictions on computer imports into the country, realizing the crucial role that accessible microcomputers can play in the country's economic development.

A climate-hardened Kaypro 10 aids field work in a study of Mayan civilization.

Monitoring elections. The American Friends Service Committee (Quakers) used a Kaypro to help monitor elections in El Salvador this past summer. As El Salvador's new president Jose Napoleon Duarte attempts to restore peace to this war-wrecked country, the same Kaypro 2 is being used by the Friends Service Committee in its San Salvador office.

Tracking the 'desaparecidos.' Thousands of political dissenters disappeared and presumably met violent deaths while Argentina was under military rule from 1976 to 1983. In Buenos Aires, the Center for Legal and Social Studies (CELS) is using a Kaypro 2 to extensively document the cases of *los desaparecidos*, the "disappeared ones." Now that Argentina has a constitutional government, the kidnapping, imprisonment, torture, and murder presumably suffered by *los desaparecidos* are being investigated by the courts. The information on the Kaypro is proving invaluable as legal evidence, and it is unique. CELS is the first Third World human rights organization ever to assemble such a database, and its work is serving as a model for similar activist groups. The Chilean Commission on Human Rights has just purchased a Kaypro 4 for the same purpose—to coordinate and organize the available data on missing Chileans.

Exporting technology. In recent years the Chinese have admitted a fascination with western technology. In September 1983, a group of Chinese professors from the University of Tianjin, office managers from China Airlines, and factory managers from China's steel and camera plants were particularly fascinated by a hands-on demonstration of

a Kaypro 2 and a Kaypro 4. Rene Moore, an American who runs a business called The Calculating Lady, was invited to China to lecture on desktop computing and chose to take Kaypro machines along. Later, through the connections Moore established, 20 computers were donated to the fledgling Computer Science Department at Tianjin University. According to Moore, these machines and six others recently donated to Xian Medical College will assist China in the "Capitalist Experiment," in which Chinese managers are trying out traditional western business methods in order to raise productivity.

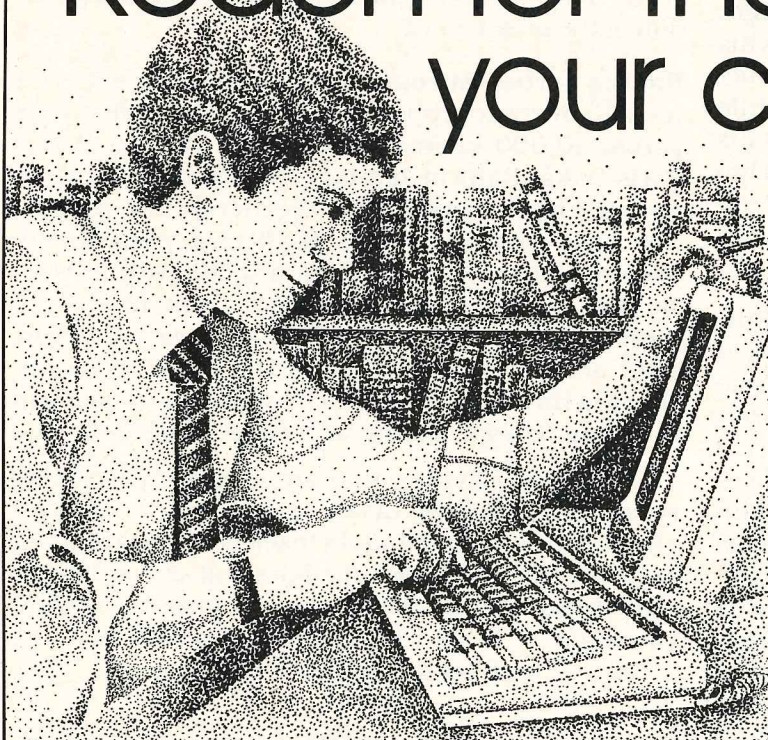
Ski lift ticketing. Thanks to a battery of Kaypro 2 computers and Kaypro printers, ski lift ticketing systems are all downhill now at Killington, Vermont, one of the largest ski areas on the east coast. Dave Langlois of Hillside Systems designed the computerized ticketing system to both generate passes and track the skiers who use them. Langlois chose Kaypros because of their portability and ruggedness. "They really get pounded around at the ticket

booths," said Langlois. "But with the Kaypros, I don't have to worry about people spilling coffee into them. Besides, the machines fit inside a ticket booth."

King crab farming. In the future, sea farmers may provide a large portion of the world's food. "Aquaculture takes ocean hunting and gathering a crucial step further," said Bill Bernard, director of the Caribbean King Crab Development Project, sponsored by the Smithsonian Institution's Marine Systems Labs. The king crab project is teaching local fishermen how to grow and sell the tasty crustaceans. Kaypro computers are used by the researchers to help compile and analyze the project data, and to write scientific reports. The director of another Smithsonian aquaculture project, Gordon Sanford of the Antigua Shrimpery, also favors a Kaypro computer for his research collation. In fact, Sanford has been seen driving his motorcycle around the island, visiting the shrimp research project sites, with a Kaypro strapped to the back of the bike.

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co-director of the Orthopedic Bio-engineering Lab of the University of Utah, favors his older Kaypro II to assist him in his research. "The Kaypro led me to change the way I do my work," said Dr. Daniels. "The older minis and mainframes were a pain in the neck." Dr. Daniels should know about pains in the neck—his work entails development and improvement of orthopedic implants, bone fixation devices, and joint replacements. Dr. Daniels also studies tissue mechanics and the properties of bones and ligaments.

Running for office. Last year's political campaigns saw a number of Kaypros on the front lines. Presidential candidate Walter Mondale toured with a Kaypro early in the race, and his campaign workers used six Kaypros to keep track of the 3,933 Mondale delegates and 1,300 alternates at the Democratic Convention in San Francisco. U.S. Congressman Jim Bates (D-California) found his Kaypro 4's portability handy when his campaign workers used the machine down at the local registrar of voters.

Calculating restoration costs. Master housewright Roy Underhill works in full period costume and uses authentic hand tools while on the job at Colonial Williamsburg, a town-museum of hundreds of restored and reconstructed antique buildings in Williamsburg, Virginia. His Kaypro II might look a little conspicuous, however. Underhill uses his Kaypro to calculate the needs of building construction and reconstruction at Williamsburg, while doing all the actual work by hand. He also uses his computer to make educated guesses about the original construction methods, combining "what-if" calculations on the Kaypro with his own knowledge of colonial technology.

Managing reindeer herds. Two Kaypros in Fairbanks, Alaska, help manage numerous herds of reindeer that are rounded up each year by Eskimo "reindeer ranchers," members of the Reindeer Herders Association. For the past three years, as part of a native economic development project, Kaypros have been used at corral sites to record each reindeer's ear-tag number, sex, and age. The data helps the reindeer ranchers determine the status of each animal and whether it is healthy, how many fawns the does have, and when the best time is for slaughter. The biggest commercial product of reindeer, by the way, is the antlers (which are shed by the bucks). Harvested horns are sold to folk doctors throughout the Orient, where potions made from powdered antlers are considered to be a strong aphrodisiac.

Inmates learn job skills. Similarly, inmates at the

Graham Correctional Center in Illinois are using Kaypro 2's to learn a life skill, essential to their adjustment to the "outside." At any given time, 16 prisoners are using Kaypros in an open-entry vocational training program titled "Micro Data Processing," taught by Mark Rice, an instructor from the participating Lincolnland Community College.

A prison psychologist uses a Kaypro 10 to research prisoner behavior.

Testing vocational programs. "Lifers" at Soledad State Prison in California are using 14 Kaypro 2's to learn computer use, repair, design, and maintenance. Since they are serving life sentences, most of these men will never get a chance to use their new skills in the outside world. Why bother? Lifers were chosen as the test subjects of a computer vocational program at Soledad because they are a small group within the prison with high longevity as a group. Since the test was so successful, the learning program is now being opened up to the general population of the prison yard.

Racing across Europe. One thousand race drivers took their motorcycles and four-wheel-drive cars across 10,000 kilometers of rough terrain in the Paris-Dakar Rally in January 1984. Kaypro computers were there to help if the racers ran into trouble. The vital medical records of all race participants were kept on a Kaypro 2, 4, and 10, which were carried by the medical support team in case of injury. Participants began the 20-day race in Paris, sped across Europe, crossed the Mediterranean, charged through the Sahara Desert, and finished up in Dakar, Senegal, on the west coast of Africa.

Obviously, Kaypros are hard at work performing some very unlikely tasks in even more unlikely places. They are proving themselves in the trenches of field work and under the harshest of conditions. This demonstrates clearly that a computer is what you make of it, and the users mentioned here are definitely making the most of their Kaypros. □

Mary DeDanan is a San Diego writer now addicted to exploring unique applications of Kaypros. If you know of an application that ranks with the above, write Mary in care of PROFILES.

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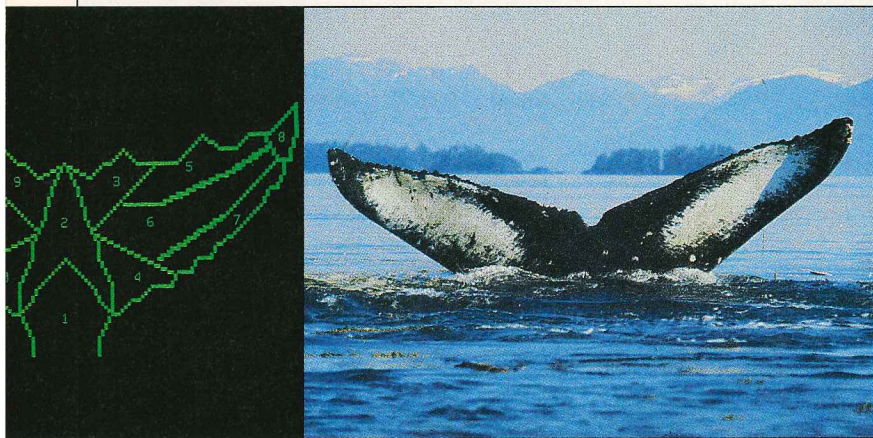
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At this stage the researchers resorted to visual comparison of photographs, but the number of photos had been narrowed from several thousand to four or five. Once the match was made, data associated with that particular animal (when it had been seen before, where and with whom) could be accessed from another database. The problem of field identification had been solved.



As the technique of individual recognition begins to be used on other whale species, similar programs are being developed. Access to data in the field is absolutely essential in finally establishing exactly how many whales are still left and how they are grouped. Now a Kaypro will take its rightful place in the array of tried-and-true field research tools. □

Curious Humpback Habits

Once there were 120,000 humpbacks worldwide—15,000 in the North Pacific alone. In the last century and the first half of this century, the whales were slaughtered; only 5,000 survive today. The International Whaling Commission prohibited their capture in 1966, and they have been on the United States' endangered species list since 1970.

Like all of the great rorqual whales, the North Pacific humpbacks are seasonal feeders. To them, the summer is one long meal, and they gobble down the schooling fish and small shrimp that abound in their Alaskan feeding grounds. In the winter, they become anorexic, moving to subtropical breeding areas and living off body fat.

The humpbacks leave their winter locations in the spring and embark on a two-month journey to the shallow waters off the coast of Alaska. They first enter the Gulf of Alaska in April, and by May whales are seen in Prince William Sound and in the waters of the Alexander Archipelago.

'Big wing' from New England

The humpback is known in scientific circles as

"megaptera novaeangliae," which can be translated roughly as "the big wing from New England." The initial surge of humpback whaling began in New England, where the whales were first described.

The "big wing" refers to the humpback's pectoral fins, or flippers, which are proportionately much larger than those of other whales. These huge "wings" make the massive animals remarkably maneuverable. Adult humpbacks weigh 40 to 50 tons, yet they can glide and dive through the water like porpoises, and they can lunge completely out of the water. They arch into the air, flip over, and land squarely on their backs, sending water shooting into the air like humans doing "cannonball" dives off the high board. But a 50-ton cannonball makes an explosive, jarring slap on the ocean that can be heard for five to ten miles above the water and slightly more underneath. It creates a crashing gusher that can send water 150 feet skyward and makes a whale-sized wave.

Feeding

Equally impressive are humpbacks feeding. Humpbacks are baleen whales. That is, they have no teeth in their lower jaw, only closely spaced sheets of baleen—a material exactly like your fingernail—hanging from their upper jaw. They are filter feeders. A whale will just plow through a school of fish with an open mouth, and the water passes through the baleen while fish are retained inside. Humpbacks have also been seen using a technique that is called "bubble netting." A whale will blow a ring of bubbles around a school of fish, herding the fish together and urging them toward the surface. Then the whale will come up through the congregation of prey with mouth open, sometimes breaking through the surface of the water with fish jumping out of the pool of water formed by its gaping maw.

Living in a world of sound

Keep in mind that a whale lives in a world of sound, just as we live in a world of sight. Although the humpback's vision is as acute as ours, in Alaska it is virtually useless. The water transmits light very poorly because of all the organisms and other matter floating in it. Humpbacks are one of the most acoustically active baleen whales. They make an enormous number of different sounds: grunts, growls, whines and moans and just about everything in between.

These are the animals who "sing" in their winter breeding grounds. It is believed that they use their song the same way birds use their bright plumage. It advertises the animals' fitness and availability for reproduction. The entire herd in a given area sings

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HUMPBACK HABITS

the same song with slight individual variations known as signatures. Each year the song changes. Broken bits of song begin to be heard at the end of their summer stay in Alaska. By the time they have arrived at the breeding grounds, all the whales are singing the new song for that year.

The sounds made in Alaska are entirely different from the mating songs of the south. Up until five years ago it was thought that the animals were completely silent when they went north to feed. To date, 25 different types of sound have been categorized. They are heard primarily when the animals are engaged in group feeding. It is still a hotly debated issue whether this feeding and the concurrently generated sounds are due to cooperation or competition.

High-energy communication

Whatever the case, these and the southern songs are generated at what are almost unbelievable levels of energy. At 120 decibels sound will deafen you, probably permanently. Levels of 170 and above will do a very effective job of damaging or actually killing.

Humpbacks generate much of their sound at 180 decibels and above. Part of this tremendous energy is probably used in communicating over long distances. In Alaska, researchers are beginning to investigate the possibility that this sound may be used to stun, damage or kill prey.

What humpbacks are doing with all of these sounds is only one of the questions facing biologists. Nor do biologists know why the whales don't appear to be reproducing as quickly as anticipated—or, for that matter, exactly how many humpbacks exist. They have no idea of the whales' migratory routes; nor have they defined their social groupings. The answers will come from the research. □

William Lawton is a marine biologist who has been studying humpback whales in Alaska and Mexico since 1979. His research has been supported by the National Marine Mammal Laboratory, Earthwatch, the Center for Field Research, the U.S. Forest Service and the Alaskan tour industry.



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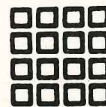
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Accounts Payable Aging
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Check Register
Checks
G/L Transaction Register

PROGRAMS

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Enter Credits
Report Generation
Decide Vouchers to Pay
Query Vendor Account Status
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This software package will help you process invoices on a timely and accurate basis, as well as give you immediate access to current customer information and account aging. Time consuming calculations, postings, preparation of statements and summarizations are all performed by the system. The output format accommodates either stock paper or standard pre-printed invoices and statements.

REPORTS

Customer Account Detail
Aging Report
Transactions Report
Customer Accounts Listing
G/L Transactions Register
Invoices
Statements

PROGRAMS

System Initialization
Customer File Maintenance
Query Customer Activity
Enter Transactions
Invoice Generation
End-of-Period Processing

\$50 CP/M PAYROLL SYSTEM \$80 MS-DOS

This software package enables you to prepare the payroll quickly and accurately. It rejects erroneous input by using built-in cross checks that insure accuracy of calculations. Besides calculations, it automatically handles all check preparation and computation of federal reports. It prepares a payroll journal for directly posting to the books.

REPORTS

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Payroll Register
Payroll Worksheet
Paychecks
Monthly Summary
G/L Transactions Register
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Schedule 941-A
Form W-2

PROGRAMS

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Speaking Through Your Kaypro

How to use your computer to plan and write a speech

by Leon Fletcher

When Mark Twain was appearing as a lecturer some 100 years ago, he often said: "It usually takes me more than three weeks to prepare a good impromptu speech."

If Twain were alive today, he could prepare his speeches on a Kaypro and save more than 99 percent of his preparation time. I know—I've designed dozens of speeches on my Kaypro II, cutting Twain's "more than three weeks" to just a few hours. On a Kaypro, designing a speech is a simple, specific, sensible, five-step process.

But scoffers frequently claim, "I don't give speeches!" Maybe you don't. But chances are you will. Consider:

- ▶ Three-fourths of our communication is through speech, only one-fourth through writing.
- ▶ Kaypro users' groups are growing, with more and more members speaking up, sharing information, presenting their ideas, offering tips and techniques to others.
- ▶ People who use Kaypros are usually professionals, managers, supervisors, administrators, leaders from a variety of fields—people who are giving more and more speeches these days. They give speeches on the job and off. They talk about competition and cooperation, safety and success, production and personality, motivation and meditation and a mind-boggling range of other topics.
- ▶ Activists and citizens with all kinds of backgrounds and interests are speaking more frequently to government agencies—city councils, school boards, planning commissions, county supervisors, public meetings of all kinds.
- ▶ Self-help groups, churches, clubs, and associations of all types are having more of their mem-

bers give speeches in programs, religious services, fund raisings, project developments, and such.

Most significantly, public speaking—like word processing—is one of our greatest growth fields. Look at the facts:

- ▶ Toastmasters, the international club in which members help each other improve their speaking, has more than doubled its membership in the last five years.
- ▶ More than 65 cities across the nation have built conference centers in recent years, and all feature special rooms and equipment for speakers.
- ▶ Speech is "essential" to some seven of every ten jobs, says the Department of Labor. Off the job, speech is even more important.

California has recently added instruction in speaking as a requirement for graduation from college; other states are talking about following suit.

But until now, apparently no one has *united* two of our most powerful communication tools—word processing and public speaking. Search, as I have, the numerous computer magazines, newsletters, tip sheets, guides, instructional manuals, and handbooks and you'll be hard pressed to find even a passing mention of public speaking.

Yet a word processor can be a speaker's greatest aid—by far!—in designing a speech.

Establish a 'Speech Disk'

Before you begin preparing speeches on your Kaypro, you should designate one disk as your "Speech Disk" and establish three separate files on it. Each file should hold one of the following essential guides to designing a speech.



ILLUSTRATION BY RICK GEARY

File #1: This file, which I've named FORMAT.SPH on my disk, should contain a copy of the following "Format for a Speech."

FORMAT FOR A SPEECH

I. Introduction

- A. Attention-getter
- B. Preview

II. Discussion

- A. Main points
- B. Arranged logically
- C. Supported with data

III. Conclusion

- A. Review
- B. Memorable Statement

Consider that file to be a kind of "Super Prompt" or "Help Menu." Call it up whenever you need to jog

On a Kaypro, designing a speech is a simple, five- step process.

your memory for details of the structure of a speech.

Using that "Super Prompt" is especially easy if your software lets you split your screen—display two separate windows on the screen at the same time. Then you can have that "Format for a Speech" in the upper window to refer to as you design your own speech in the lower window.

That format is a general guide or pattern for the structure of a speech—*any* speech. It will work for a formal presentation to a board of directors or a casual talk to a small club. It is appropriate for a one-minute announcement or an hour-long lecture.

You'll no doubt remember that format, or one very similar to it, if you've ever taken a course in public speaking. If you haven't studied public speaking, learning that format will make designing a speech much easier.

To help you use that format most effectively, here is a cram course on the structure of a speech.

You'll note the format prescribes that a speech—*every speech*—consists of three main parts: an "Introduction," "Discussion," and "Conclusion."

In the "Introduction," the very first thing you should present is an "Attention-Getter"—a startling statistic, exciting example, interesting quotation, good joke, or such. Your goal here is to capture the interest of your listeners.

Then "Preview" the subject of your speech in just

a sentence or two. You might say something such as: "This evening, I want to talk with you about how you can make money by using your Kaypro to. . . ." Usually it is only *after* you've got the attention of your listeners and previewed your speech that you should express any greetings that may be necessary—to the audience, chairperson, guests, etc. Notice that the introduction to the television program "60 Minutes" follows this guide. First you see and hear a ticking clock, intended to get your attention; next, brief previews of the stories (points) to be presented on the telecast; then the greetings: "Good evening. I'm Mike Wallace. I'm Morley Safer. I'm. . . ."

All told, the introduction to your speech should generally be no longer than ten percent of your speech. Shorter is better.

Next comes the main part of your speech, the "Discussion." Usually it should be about 85 percent of your entire talk. Here you present your "Main Points"—sub-topics, ideas, or parts of your speech subject. Present just two to five points—more than that will be forgotten by most listeners.

Those points should be "Arranged Logically"—in some clear and sensible sequence. The points might be in the order of their importance, in the sequence in which they should be done (such as the arrangement of the points in this article), or some other logical order. Your objective should be to structure your speech so it will be easy for your listeners to follow and remember what you're saying.

Each point should be "Supported With Data"—examples, statistics, charts, illustrations, testimony, and other proof or clarification of your main points. Generally, you should present two or three bits of data to support each main point in your speech. Don't use just one type of data exclusively; a speech packed with statistics only, for example, may turn off those in your audience who consider figures boring. Instead, present a generous mix of quotations, stories, audio and visual aids, and such throughout your talk.

Finally, the "Conclusion" should restate the subject of your speech, and then close with a "Memorable Statement"—a brief quotation or story, for example, that will help ensure your audience will remember the essence of what you've said. The "Conclusion" should be only about five percent of your entire presentation.

Write a 'Speech Guide'

File #2: On this file write the following "Speech Guide." This guide is preferred by some speakers—especially beginners or those who give a speech only occasionally—as an alternative or additional

aid to help them recall the structure of a speech. On my disk, this file is named GUIDE.SPH.

SPEECH GUIDE

I. Introduction

- A. Attention-getter—startling statistic, unusual example, etc.:
- B. Preview—The basic point is:

II. Discussion

- A. 1st Point:
 - 1. 1st data supporting 1st point:
 - 2. 2nd data supporting 1st point:
More data, if needed:
- B. 2nd Point:
 - 1. 1st data supporting 2nd point:
 - 2. 2nd data supporting 2nd point:
More data, if needed:
- C. 3rd Point:
 - 1. 1st data supporting 3rd point:
 - 2. 2nd data supporting 3rd point:
More data, if needed:

III. Conclusion

- A. Review—In sum, what I've said is:
- B. Memorable Statement—quotation, etc.:

The lead-in lines presented in that partial outline can be reworded to fit your own style of expression. To preview your speech subject, instead of saying, "The basic point of my speech is. . ." you might say: "Today, I'd like to help you learn about. . ." "Let's look at the facts behind the problem of. . ." "There are three reasons why you should vote to. . ." Obviously, the variations are limitless.

Make a 'Skeleton Outline'

File #3: Enter one more file on your speech disk—the following "Skeleton Outline." It's the basic outline you fill in as you design your speeches. What goes into each point of this outline is detailed in the previous two outlines. I name this file SKELETON.SPH.

Speech Title: _____
To be Presented To: _____
On (date): _____
At (place): _____
Event: _____

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I. Introduction

- A.
- B.

II. Discussion

- A.
 - 1.
 - 2.
- B.
 - 1.
 - 2.

- C.
 - 1.
 - 2.

III. Conclusion

- A.
- B.

Follow the five-step process

Now your Kaypro is ready for you to start designing speeches. Follow this five-step process.

1. *Open a file for the speech you're planning.* I usually name this file after the audience to which I'm to speak. Last week I spoke to a group of ministers, so that file was named MINISTER.SPH.

2. *In that file, write a "Planning List."* Your "Planning List" should consist of brief statements of all of the points and all of the data you want to present in your speech.

The sequence of those points is not critical at this time. Virtually no one can prepare that list in the exact order that the information will be presented in the speech. You'll re-order the sequence in step 4.

Review that "Planning List" to insure you have all the specifics you need for your speech. Unfortunately, few of us have a mind capable of complete recall. Nearly always we need to check the wording of a quote, look up the name of some key person, add more information, and so on. We must then:

3. *Complete additional research.* To find missing bits of information, most of us—even owners of word processors—still go to our local libraries to do our own research.

But of course you know that by using a modem with your Kaypro you can now call up one of the growing number of databases and the specific information you need may appear on the screen of your word processor. Yet apparently few users of word processors realize the power of today's databases.

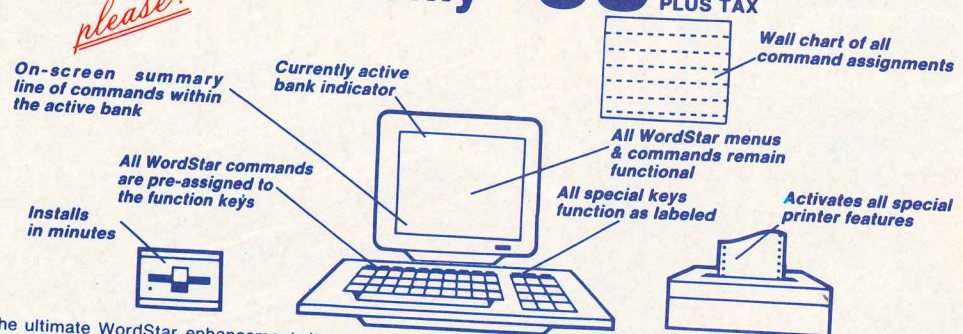
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Need financial information? Connect your modem with Dow Jones News/Retrieval, Box 300, Princeton, New Jersey 08540, phone (609) 452-2000.

For legal, technical, scientific, or medical details for your speech, contact—via your modem—Dialog, 3460 Hillview Avenue, Palo Alto, California 94304, phone (415) 858-2700.

Just how many databases you can call on for information is hard to pinpoint. One source says there are more than 1,500. According to the author of the book *Introduction to CP/M Assembly Language*, Dr. Jon Lindsay, "New databases are becoming available at an amazing rate."

Once your research is completed and you have all your points and data entered on your "Planning List," you're ready to:

4. *Enter your information in the "Skeleton Outline."* First, call up your file SKELETON.SPH and make a copy of it on the file you've set up for the speech you're designing.

Then fill in the five blanks at the top of the "Skeleton Outline" with the specifics of what, where, when, etc. about your speech. Keeping that information before you as you outline your speech will help you focus your ideas on the purpose of your speech. That's valuable in making sure all points and data are appropriate for the audience for whom you're designing the speech.

Now your Kaypro can start doing one of the things it does best: move blocks of information back and forth, add material in any sequence, delete, store specifics for later use, add details from other files and other disks, and so on.

Go through your "Planning List" and pick out the most interesting specific—the statistic that will shock your listeners, the story that will hold them spellbound, the quotation that will get them nodding in agreement. Wherever that item is in your "Planning List," move it into Point A in the Introduction, to be your "Attention-Getter."

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SPEAKING

Then continue working your way through the "Skeleton Outline," completing it with specifics you take from your "Planning List." If you need to refresh your memory of what information goes where, consult your files of the "Format for a Speech" or the "Speech Guide."

When you're ready to select the last point for your speech, the "Memorable Statement," follow the same tips as were suggested for picking your "Attention-Getter." Try to make that final statement of your speech so dramatic, so moving, so stimulating that your listeners will be sure to remember your speech.

The final step in designing a speech on a Kaypro is to:

5. *Use your printer to prepare whatever material you want to refer to when you give your speech.* You have two possibilities. The simplest: a straight, conventional printout of your completed outline. Many speakers prefer a regular page length (8 1/2 x 11")—instead of note cards—because its larger size is easier to read.

Your other choice: adjust the margins on your Kaypro to produce a printout just 25 characters wide, so your printer will turn out 3x5-inch note cards for you. Their advantages are clearcut: inconspicuous and easy to handle.

In ancient times—before Kaypro—I'd design my speeches on my old typewriter, or scribble them out in longhand. Of course you know the problems I'd meet: I'd jot down a few points and then remember material that should have come earlier in the speech. I'd have to repeatedly cross out points, rewrite them, or draw messy arrows showing new locations for the material. Then I'd retype. And retype again. Often I'd have to retype my "Planning List" and my "Speech Outline" a dozen or more times.

Such drudgery is behind me. Now, you, too, can design speeches easily and quickly. Your Kaypro can do much to help you fulfill the charge of Scottish writer Robert Louis Stevenson: "The first duty of man is to speak; that is his chief business in this world." □

Leon Fletcher is Emeritus Professor of Speech, Monterey Peninsula College, California, and a fulltime freelance writer. He has written nine books and more than 300 articles. His most recent book is How to Speak Like a Pro, a Ballantine paperback.

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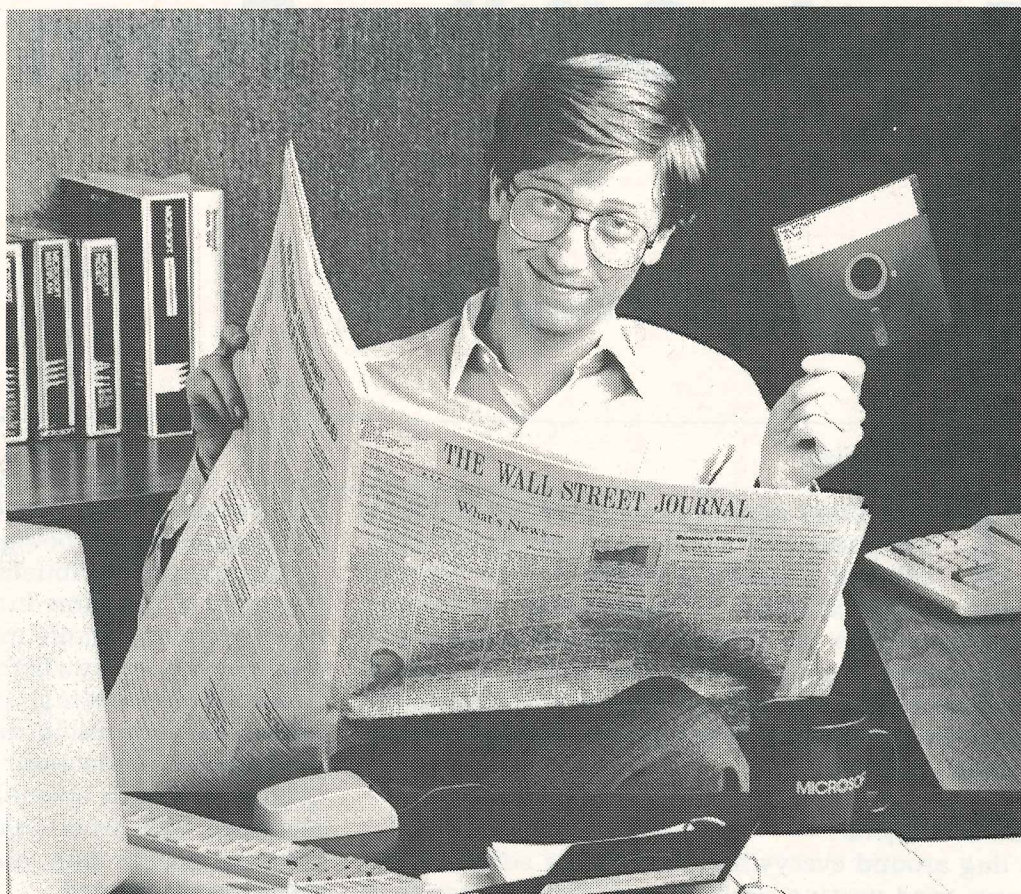
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Fresh Off the Farm

Micros find their niche in agriculture

by Roger Weiss

Three years ago when I started looking for a computer and software to use in my agricultural consulting business I felt like the early pioneer crossing the barren desert searching for a new home. My TI 59 programmable calculator was excruciatingly slow, I was trying to push it beyond its abilities, and the cryptic output from the little thermal printer didn't present the professional image I needed.

Enter Kaypro

I dug around everywhere looking for software and even tried writing programs on several brands of computers. I stumbled onto a good ration balancing program at about the time the Kaypro appeared on the market. A dealer reluctantly parted with his first demo Kaypro (then known as a KayComp II), and I entered the computer age.

My primary use of the Kaypro is in the evaluation and least-cost formulating of dairy rations using the MIXIT-2 ration balancing program. (Sometimes I think we know more about feeding livestock than feeding humans.) We precisely balance the rations of our superstar milk cows for quantity and quality of protein, energy, fiber, and more than a dozen minerals and vitamins in the hope of exceeding an average of 20,000 pounds of milk per cow per year.

I klutz my way through reports and correspondence using the Select word processor, and use a few spreadsheet templates to examine my clients' management and make recommendations. Billing of clients is also handled by the Kaypro. And I kill too much time writing programs for the business and teaching beginning programming at our Kaypro Users' Group (KUG) meetings.

Today I am amazed at the wealth of software applications available for the farm and for the busi-

nesses supplying agriculture, and at the many unexpected niches being filled by computers.

Farmers and agribusinesses are using computers for many of the same functions offices, stores, and manufacturing plants in the city do. The standard applications everywhere are a general ledger for financial accounting, spreadsheets for cost and enterprise accounting, and a database or packaged program for production, inventory and scheduling. Computers with special software are starting to interface with other equipment to control production and collect data, and telecomputing from the farm has blossomed.

Kaypro down on the farm

Every year when the huge fields of jonquils, daffodils, and tulips appear in the Skagit Valley of Western Washington, we are reminded that spring is just around the corner and one of the major bulb growing areas of the world is about to leap into action. Bill Lefeber of the Lefeber Bulb Company says things aren't all rosy (daffodilly?) in the bulb business. Bulbs are a commodity—like corn and soybeans—that are traded in the world market and happen to be in oversupply. Some years ago Lefeber entered the cut flower market to help cash flow and survive in the bulb business. Today his major income is from cut flowers shipped to Boston, New York, San Francisco and other cities for three or four weeks in early spring. Five years ago he mechanized much of the harvesting.

Lefeber's latest survival effort is a computerized payroll system using a Kaypro 4. Before the Kaypro, Lefeber and his wife spent a day and a half doing each weekly payroll for the 300 flower pickers, just when he needed to spend all of his time in the fields and on the phone. Needless to say, the payroll soon

was several weeks behind schedule. Now, in less than four hours Mrs. Lefeber whips the payroll out on time. At year's end all the tax, W-2, and unemployment reports are printed in a few hours, eliminating weeks of toil. Lefeber's next accounting project will be starting up a general ledger.

Record keeping and management

The software now included with Kaypro computers can tackle most of the record keeping and management chores on the farm. Fred Moore, a dairy farmer in Stanwood, Washington, can testify to that. Moore designed an application with Perfect Filer that stores all of his cow records. When he needs to check breeding dates or sort cows for the veterinarian on

now consider cash flow more important than net worth, and when the banker sits him down to fill out a cash flow form he is already in control and can say, "Here it is!"

Net worth and profit/loss statements are still important, and Moore's only software purchase has been Agricultural Management System's Shubox accounting system, which provides these reports. Moore says the Shubox is very obvious and easy to use, and he is satisfied. Modifying the sample chart of accounts to suit his needs took some careful consideration. Now all he does is enter check amounts and deposits in the check writer module and ask the general ledger module for reports. The checkbook balance is always available and up to date. Year-end



herd health day, Perfect Filer prints out a report with all the data needed. Moore says it is much faster, easier, and more accurate than sorting through his old card file. A local milk testing organization checks his cows monthly and returns a complete production printout within three days. He looked at dairy herd management programs, but says they cost more than his total investment in computer hardware and software. He receives all the herd data he needs from Perfect Filer and the cow testing organization.

Moore also does a meticulous job of managing his finances. Perfect Calc has a number of assignments. For instance, depreciable assets, such as cows, are tracked on a spreadsheet with sale dates, commissions, and any capital gains or losses. A spreadsheet monitors the budget and cash flow. He says lenders

closing requires a few adjusting entries, such as depreciation and income tax.

Other agriculture-related applications

Spreadsheets are a great tool for illustrating farm management in high school vocational agriculture classes. Teacher Wesley Kentch bought himself a Kaypro just for the use of the spreadsheet in school and for managing his small farm. He has developed spreadsheets for double-entry bookkeeping, farm inventory, and livestock enterprise analysis with calculated break-even costs. He can create a whole new scenario on the enterprise analysis in just a few minutes.

Interfacing with other black boxes

The Kaypro is capable of communicating through

its serial and parallel ports with many types of smart equipment. (See article by Jerry Houston in this issue.—Ed.) It can control production equipment such as irrigation pumps and sprinklers, assembly lines, or printers, and can also receive and store data from equipment like milk meters, soil moisture probes, temperature gauges, or modems. Manufacturers are starting to advertise the interface equipment and required software.

Five to ten percent of the cows in this area are now fed grain according to individual milk production by self-contained computer feeders, and a few dairy farmers already have computer feeders and parlor milk meters linked with central computers.

Island Farms Dairy in Victoria, British Columbia, a cooperative plant buying milk from 52 member farms, needed to be more precise in evaluating raw milk and finished products such as fluid milk, ice cream, yogurt, and cottage cheese. Last summer it purchased a Multispec infrared milk analyzer to test protein, lactose, butterfat, and total solids—plus a Kaypro 10 computer to accumulate and interpret the results. The analyzer and Kaypro talk back and forth via the serial (RS-232) port. A program with calibration curves crunches the test results and translates the analysis to a readable form. Next

A few dairy farmers have feeders and milk meters linked to computers.

the Kaypro multiplies the analysis by the size of the milk purchase to create an inventory, which is then checked against the sales of finished products. Quality Control manager Norman Lim says quality tests and inventory are much more precise with the new system, which comes with an extensive library of programs.

(All you ice cream freaks would enjoy the recipe program. Just select a recipe and flavor from a menu, check the ingredients available, and the printer will churn out the mix for a 1,000-gallon bowl of rich, 10 percent butterfat ice cream in your favorite flavor!)

The traveling salesman

The Kaypro computer can show its true grit when employed by a traveling salesman or consultant. Most of the feed salesmen with portable computers in Washington have Kaypros and the MIXIT-2 feed

blending program. My high-mileage Kaypro 4+88 spends many of its days bouncing around in the trunk of my car.

Matt Bachleda and Doug McGreevy of the Lynden Feed Store in the Dutch community of Lynden, Washington, compete for the use of their lone Kaypro II. The Kaypro travels to many dairies to formulate rations using MIXIT-2. A spreadsheet evaluates the impact of milk production, herd size, and feed cost on cash flow. Back at the mill all the grain mixes are calculated on a least-cost basis, and a series of Perfect Calc files keeps track of ingredient usage, inventory, and pricing. Bachleda says they've "really put [the Kaypro] through the mill" and it works well. They throw it around like a piece of luggage, carry it around in Washington's constant rain, and have even left it outside to freeze a few times.

Down the road in Mount Vernon, Frank Standard manages a warehouse and sales facility for Darigold Feed. On the farm, Standard likes to use his dBASE II application to evaluate the farmer's dairy ration and compare it to the nutritional requirements all in one step. He also uses MIXIT-2 when a least-cost formulation is required. Pricing and inventory were also done using dBASE II until recently, when the facility was purchased by Darigold. Standard says "dBASE II is amazing—you can do a thousand things with it."

At the large Darigold mill in Spokane, Jim Fox uses a Kaypro and MIXIT-3 to least-cost all of the feed mixes in batches. The program can take a list of perhaps 20 feeds and do the number crunching on the formulations while Fox is free to manage the business.

Dr. Alvin Kay, manager of the Texas firm that developed and sells the MIXIT programs, comments that portable computers have been a positive influence on the firm's sales volume. Roughly 20 percent of their United States sales have been in Kaypro format. In fact, he uses a Kaypro in his own office. MIXIT has been sold all over the world for formulating everything from fish food to fertilizer.

Telecomputing from the farm

A great number of farmers gather data via modem, and a variety of sophisticated databases exist for supplying commodity prices, livestock and crop research, weather forecasts, public domain software, and online farm software usage.

AGNET, TELPLAN, and CMN are three of the regional systems made available to farm computers by the Cooperative Extension Service. These networks primarily allow you to run programs such as

ration formulation, enterprise analysis, and irrigation scheduling. These are good beginner programs. You can then decide if you need a program with more sophisticated functions and the ability to store data on disk.

Doane Publishing, Inc., offers the Infoline bulletin board to subscribers to its "Agricultural Computing" newsletter. Infoline provides grain and livestock marketing advice, public domain BASIC programs, and information on new products and upcoming events.

Subscribers to BRS or Dialog can access the AGRICOLA information service of the National Agricultural Library. AGRICOLA has references to almost two million books and journals published in the last 15 years.

For the grain or livestock producer who needs the latest cash and futures prices, AgriData Resources provides agricultural information and computing on the AgriData Network. This network has current information from commodity exchanges, specialized weather reports, crop forecasts, market analyses and recommendations, agricultural and Associated Press news, and a database with such

diverse information as the latest dairy sire summary. Subscribers also receive the *Farm Futures* magazine and a newsletter.

Farmers gather data via modem from a variety of sophisticated databases.

AgriData just received statistics from an independent reader survey of *Farm Futures* magazine, which included the number of farmers using computers. Obviously the readership includes the subscribers to AgriData Network and the larger farmers who study the futures markets, but the staff still didn't expect to find that 22 percent of the readers had computers. Some financial institutions now require farmers to have a commodity marketing plan, which may include constant monitoring of the futures markets.

In The Beginning

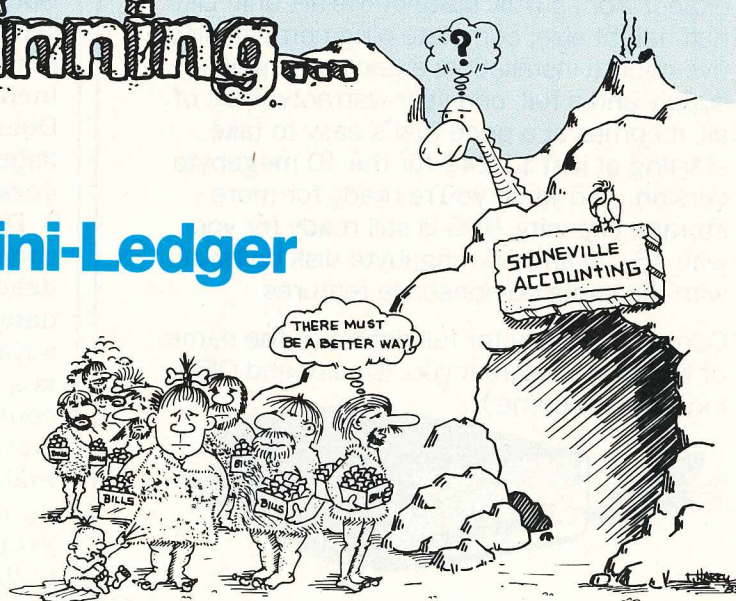
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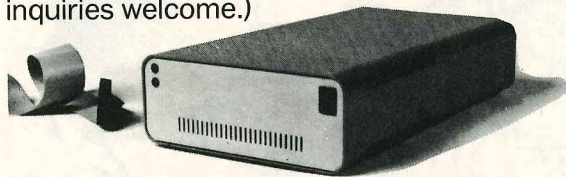
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FARM

Sources of software listings and reviews

The first place to look for software listings is the thick *Kaypro Software Directory*, which should be available at your dealer. This contains a section on agricultural software available in Kaypro format. Also check with your KUG library and members for public domain programs or suggestions.

Extensive listings and critical reviews of agricultural software are hard to find, but I stirred up some good news. A comprehensive directory of software and a full bi-monthly farm computer magazine will be available about the time you read this article.

Doane Publishing's newsletter, "Agricultural Computing," contains two or three reviews and cur-

A computer can be a great survival tool for agriculture.

rent news each month. Subscribers receive the *Source Book*, which is a fat binder with sections on software source lists, languages and programming, communications, and hardware. New pages included with the newsletter are added each month. Doane claims to be the largest agricultural publisher, and its reviews are strongly worded because it doesn't accept any advertising.

Doane is now printing the only major directory of commercial agricultural software, with details and descriptions of more than 600 programs. The database of agricultural software was developed on a Kaypro computer. Editor Scott Watson says there is a tremendous number of poor programs, and he could personally recommend only 80 of the 600. Watson said a major problem is the lack of strong market penetration by the many small software developers and dealers. Thus on-site support is not yet possible in rural areas.

Successful Farming Magazine has published a monthly newsletter called "Farm Computer News" for several years. Editor Gary Vincent announced that with the January 1985 issue, the newsletter has adopted magazine format, with paid advertising, more news and reviews, and a bi-monthly circulation of more than 10,000. Product reviews will continue to offer pros and cons and purchasing advice.

Florida Extension Economist J. Robert Strain has compiled the "Cooperative Extension Service Updated Inventory of Computer Programs" (Cir-

cular 531-A). This is a cross-referenced listing of programs generated at all land-grant universities for all types of computers, from mainframes to micros. An appendix (Circular 531-C) contains a more complete description of each program. It is worth picking through because there are rummage-sale prices for a great variety of programs. I chose one useful BASIC program from the list for just \$30, although I had to convert it from another disk format and operating system. Don't expect any dealer support on these bargains.

The looking and buying process

Agribusinesses can find integrated packages for everything from fertilizer and feed plant management to equipment and supply dealership management, or even livestock auction management. Farmers can find several packages for crop, dairy herd, orchard, nursery, or swine management. Applications like inventory, payroll, accounting, and formulating may be built in. The integrated packages are expensive and you must do things their way, so study them carefully and use them before buying. Be certain of what training and support is included in the price; this important factor is often overlooked. The alternative is to buy smaller programs and also take the time to learn and really use the flexible software bundled with the Kaypro.

My largest client has 1,500 dairy cows and heifers, extensive crop and berry operations, and a large payroll. This client recently bought an integrated package with dairy herd records, payroll, and accounting. Before deciding to purchase, the office manager attended school for a week, then actually ran the farm using the package via modem and dumb terminal for many months.

Reflections on computerizing

The change to a computer is both technical and cultural. Someone must make the mental adaptation from traditional farm operator to business manager. Management processes such as accounting, fertilizing, feeding, and planning should already be formalized in a paper system. The processes can then be moved, one by one, to the Kaypro.

Computerizing is like a king-size pizza with five extra toppings. If you try to eat it all by yourself at one time, indigestion results. If you save some of the pizza for later meals, or share it with friends, you'll feel better about it. In short, a computer can be a great survival tool for agriculture, especially if you take it slowly and share it with others. □

Source Guide

Agricultural Computing

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Roger Weiss has 20 years' experience in agribusiness and now is an independent consultant in nutrition, farm management, and computer implementation. He lives on a small farm near Arlington, WA.

Statistical Software Smorgasbord

A number-crunching program for every taste and need

by Bob Trotter

I bought my Kaypro to save my neck. College professors live in a publish-or-perish environment, and word processing is the heart of publishing. I am strongly opposed to perishing, so I bought a machine with a great reputation as a word processor. It came as a pleasant surprise to discover that the friendly machine living in my office (and occasionally being lugged home) can replace the university mainframe for another important research task: number crunching.

Scientific publications do not live by words alone; they also take numbers—not just numbers you can add up, numbers that have to be *crunched* (unmasticated they are too raw for publication). The traditional way to crunch numbers is to use a statistical package on a mainframe. The only problem is that these packages have a tendency to gobble CPU time like old-fashioned cars guzzle gas. They can rapidly deplete a departmental budget to the point where hard choices have to be made.

The solution? The discovery that, using canned statistical packages that work on a micro, Kaypro's data manipulation capacity is sufficient to keep me from having to make that hard choice.

Finding the right package

Statistical packages are for folks who are blind to the beauty of formulas. They are for those of us who must present our data in organized ways, backed up by numbers. They are not for people who can achieve nirvana by deriving formulas. They are for the rest of us, who come to statistics not out of love, but out of need.

A good statistical package is not just a library of programs. The best ones allow you to enter, check, edit, and manipulate data easily, run statistical analyses, then label and print the results, so all you

have to do is to stick it in a report and say, "Ah-ha! This proves I was right all along!"

Looking for the right package, I went to the *Kaypro Software Directory*, scanned the ads in *PROFILES*, and talked to friends. Then I sent off to companies for their literature. Statistical packages cost anywhere from \$250 to \$600. No one can afford to get a program that does not work well.

I discovered that each package differs and none has all of the procedures that mainframes offer. However, the good packages have the most commonly used procedures, plus a few extras. Some of them have good data entry and editing systems. Some do not.

From the many statistical packages available (the April 1984 issue of *Byte* researched no fewer than 24) I selected five according to the following criteria. Each had to: (1) run on CP/M Kaypros; (2) be integrated in the sense that procedures were well linked and easy to move among—not just separate programs; (3) offer at least the usual procedures commonly required by researchers; and (4) offer clear and otherwise professional documentation.

In short, I tried to narrow a very wide field of complicated packages for the specific benefit of Kaypro users. If other Kaypro-compatible packages exist that rank with those reviewed here, I have not found them.

I tested each package using my own data—data I had previously run on the university mainframe. After putting each one through its paces, here's what I found.

ABstat (Anderson-Bell, Inc.)

ABstat is friendly, easy-to-learn and built like a Dagwood sandwich—with a little bit of this and a little bit of that. It is probably best used by people

who are in a hurry or who have simple tastes. It takes virtually no time to get the package up and running.

ABstat is driven by a set of easy-to-learn commands. One particularly nice feature, for those of us who are occasionally fumble-fingered, is the "!" command. It allows you to retreat from any command without penalty. And if you forget a command, or are not sure which one to use, the "?" command gets you all the help you need in virtually any situation. Systat is the only other package reviewed here that has a help function. The other packages could benefit considerably from these two examples.

Data entry is easy to handle with ABstat. Hand entry is prompted by case number and variable. In addition, the package has a utility that allows you to read data from ASCII or dBASE II files. Equally nice, it also allows you to convert ABstat files to ASCII or dBASE II files, so you can use them with other programs you might have. I tried it both ways and it was essentially hassle free. Data editing is also easy to accomplish with ABstat. This is an important feature, especially if several people are entering data into your data files. ABstat also has a sophisticated set of features for handling missing data. This is a must for survey research, where there is always data missing because someone refuses to answer a question or two.

With ABstat's 30-day trial system, the package comes initially configured to process only very small data sets. You can get used to ABstat's command structure and decide if you want it. If you decide to keep the package, you open a sealed envelope and type a magic phrase at the proper prompt. This transforms ABstat into the full-capacity package and, simultaneously, makes your money-back guarantee disappear. This trial system is a useful feature for people who have no experience with statistical packages and those who need a few practice sessions to decide if they want to buy one. For more sophisticated users, this feature is simply an extra step in the installation process, taking perhaps an extra minute or two.

The most serious weakness of ABstat is its limited capacity to handle large data sets. It will handle a maximum of 64 variables. This is one-fourth the capacity of most of the other packages. This limitation severely restricts its use in survey research, where questionnaires often have more than 64 variables imbedded in the questions.

If I could make three wishes for each of the packages I'm discussing, my wishes for ABstat would be for lots more procedures, a much higher variable

capacity, and the ability to run in batch mode.

StatPac (Walonick Associates, Inc.)

If you do social science survey research and you can only buy one package, this is probably the package for you. It was obviously designed with survey research in mind. It creates a code book, then allows you to save, modify, and print it. StatPac offers three different types of data entry; two give you protection against the problems inherent in using research assistants to code data. StatPac allows both variable labels (40 characters) and value labels (16 characters). And StatPac has two methods for handling missing data.

The procedures in StatPac are of the solid meat-and-potatoes variety. They provide a decent meal—nothing particularly fancy, just solid stuff. The

The procedures of StatPac provide a solid meal.

package contains basics, such as frequencies, crosstabs, regression, and analysis of variance (ANOVA), but lacks a number of procedures that are nice to have for those rare but inevitable times when you need them. The software is well designed. For example, with the Crosstabs program you can generate tables with a maximum size of 50 by 50 cells, which is adequate for virtually any project.

StatPac does offer three procedures missing from the other packages but valuable to survey researchers. "Multiple Variable Response" allows you to print summary reports for a group of variables when those variables have the same response categories. And Breakdown allows you to do things such as break out income statistics by race, sex and age. The other packages can deliver the same information, but only through a much more time-consuming process. Finally, StatPac has a utility that calculates ideal sample sizes, allowing one to do a survey from start to finish.

Statpac makes it very easy to hand-enter data. I had a lot of fun trying out the line-prompted and the template-directed entry, and they worked very well. The keypunch emulator worked equally well, but I have never considered keypunching fun. It was also easy to edit the data once it was entered. What I found much more difficult was handling data that I already had sitting around in other files, either in the mainframe, on spreadsheets, or in my dBASE II

PROCEDURES					NWA	
Elementary		ABstat	StatPac	Microstat	Statpak	Systat
1.	frequencies	Y	Y	Y	Y	Y
2.	crosstabs	Y	Y	Y	Y	Y
3.	arithmetic mean	Y	Y	Y	Y	Y
4.	median	Y	Y			Y
5.	mode	Y	Y			
6.	variance	Y	Y	Y	Y	
7.	minimum	Y	Y	Y	Y	Y
8.	maximum	Y	Y	Y	Y	Y
9.	range	Y	Y			Y
10.	standard deviation	Y	Y	Y	Y	Y
11.	standard error	Y	Y	Y	Y	Y
12.	skewness	Y	Y	Y	Y	Y
13.	kurtosis	Y	Y	Y	Y	Y
14.	moments about mean			Y	Y	
15.	coef. of variation	Y		Y	Y	Y
16.	sum of squares		Y	Y	Y	Y
17.	mean square	Y	Y	Y	Y	Y
18.	chi squared	Y	Y	Y	Y	Y
19.	correlation analysis	Y	Y	Y	Y	Y
20.	linear regression	Y	Y	Y	Y	Y
21.	multiple regression	Y	Y	Y	Y	Y
22.	polynomial regression				Y	Y
23.	stepwise regression			Y	Y	Y
24.	fourier analysis				Y	
25.	analysis of variance	Y	Y	Y	Y	Y
26.	two-way ANOVA	Y	Y	Y	Y	Y
27.	three-way ANOVA				Y	Y
28.	multiple analysis of var.					Y
29.	analysis of co-variance					Y
Non-Parametric						
30.	Kruskal-Wallis			Y	Y	
31.	Mann-Whitney	Y			Y	
32.	Spearman			Y	Y	Y
33.	Wilcoxon signed ranks			Y	Y	
34.	Kendal's tau			Y	Y	
35.	Wald-Wolfowitz			Y		
36.	Wilcox rank-sum			Y		
37.	Kolmogorov-Smirnov			Y	Y	
Miscellaneous						
38.	goodness of fit	Y		Y	Y	Y
39.	log linear models					Y
40.	Poisson	Y		Y	Y	
41.	F	Y	Y	Y	Y	Y
42.	time series analysis			Y	Y	Y
43.	factorial calculation			Y	Y	Y
44.	combinations			Y	Y	
45.	permutations				Y	
46.	prob. of no repetition				Y	
47.	Bayes formula				Y	
48.	geometric mean				Y	
49.	harmonic mean				Y	
50.	quadratic mean				Y	
51.	trimmed means					Y
52.	moving average			Y	Y	
53.	standardized scores				Y	Y
54.	residual analysis		Y	Y	Y	Y
55.	multi-way correlation				Y	Y
56.	binomial distributions	Y		Y	Y	Y
57.	bivariate normal				Y	
58.	gamma function				Y	Y
59.	exponential functions			Y	Y	Y
60.	hypergeometric functions			Y	Y	
61.	inverse normal functions			Y	Y	
62.	Khrgian-Mazin				Y	
63.	logarithmic functions				Y	
64.	negative binomial				Y	
65.	normal functions				Y	
66.	Pearson product moment				Y	
67.	t statistic	Y	Y	Y	Y	Y
68.	Fisher's exact test			Y	Y	Y
69.	contingency tables			Y	Y	

	ABstat	StatPac	Microstat	NWA Statpak	Systat
70. Durbin-Watson	Y	Y	Y	Y	Y
71. Freidman			Y	Y	
72. hypothesis tests (means)			Y		Y
73. hypothesis tests (prop.)			Y		Y
74. save residuals	Y	Y	Y	Y	Y
75. correlation matrix		Y	Y	Y	Y
76. Z-value transformation	Y	Y	Y	Y	Y
77. partial r		Y	Y	Y	Y
78. Cramer's V		Y			
79. log-linear models					Y
80. covariance matrix					Y
81. Pearson correlation matrix					Y
82. gamma matrix					Y
83. Guttman mu2 coefficients					Y
84. Wilk's lambda					Y
85. theta					Y
86. analysis of repeated measures					Y
87. Pillai trace					Y
88. Hotelling-Lawley trace					Y
89. nested factors					Y
90. trend surface analysis					Y
91. principle components analysis					Y
92. multi-dimensional scaling					Y
93. Kruskal stress formula 1					Y
94. Guttman coef. of alienation					Y
95. discriminant analysis					Y
96. factor analysis					Y
97. canonical correlation					Y
98. Monte Carlo simulation					Y
99. Spearman rank corr. matrix					Y
100. frequencies histogram	Y	Y		Y	Y
101. scatterplots	Y		Y	Y	Y
102. stem-leaf plots					Y
103. box plots					Y
104. split plot analysis					Y
105. probability plots					Y
106. break down		Y			
107. multiple var. response		Y			
108. random number generator	Y	Y	Y	Y	Y
109. sample size generator		Y			
total	35	35	53	69	75

DATA MANAGEMENT and DATA ENTRY

	ABstat	StatPac	Microstat	NWA Statpak	Systat
1. create code book		Y			
2. label reports	Y	Y	Y	Y	Y
3. variable labels	Y	Y	Y		Y
4. value labels		Y			
5. keypunch emulator entry		Y			
6. line entry	Y	Y	Y	Y	Y
7. template defined entry		Y			
8. editing possible	Y	Y	Y	Y	
9. merge files	Y	Y	Y	Y	Y
10. delete cases	Y	Y	Y	Y	Y
11. create data subsets	Y	Y	Y	Y	
12. sort files	Y	Y	Y	Y	Y
13. data transformations	Y	Y	Y	Y	Y
14. recode	Y	Y	Y		
15. recode if		Y			
16. select	Y	Y	Y		
17. select if		Y			
18. compute	Y	Y	Y	Y	Y
19. lag transformations	Y		Y	Y	Y
20. curve smoothing			Y	Y	
21. deseasonalization			Y	Y	
22. rank order	Y	Y	Y	Y	Y
total	14	19	16	13	10

files. The package has a downloading utility, so it was possible to use general ASCII files from the mainframe, but that is about it. The other packages offer much more flexibility in this area.

My three wishes for this package would be for it to have an index in the manual (an irritating oversight), to include a lot more procedures, and to really beef up the package's ability to use externally generated data files.

Microstat (Ecosoft)

Microstat is a good, solid statistical meal, with a bit of dessert. The statistical programs can be accessed through both interactive and batch mode, which is not possible with the other packages. The printouts include variable but not value labels. Data entry is prompted by case number and the variable name and number. Editing data is relatively easy. The package has a good description of missing data handling, as well as in-depth information on how missing data affects each of the major operations.

The accompanying tables demonstrate that Microstat falls between the other packages in procedures calculated and in the sophistication of data

labeling and entry. For people who can only buy one package, it is a decent compromise between the best data entry and the most statistical procedures available. Apparently no one has yet decided to do both extremely well.

I really appreciated Microstat's ability to use externally generated data files with its programs. Microstat will accept comma-delimited ASCII files, fixed-field ASCII files, .DIF files, and dBASE II (.DBF) files. This greatly multiplies one's access to a wide variety of data sources. I did, however, have trouble using Microstat's batch mode or command file format. It takes at least one dry run through the program to set up the file. This feature is useful only when you want to run a lot of statistics and don't want to babysit the computer.

You will need considerably more time to put these files together than you would if you were using the batch processing system of StatPac, but it can be done. Researchers running tests on a single variable, or even a small number of variables, will find Microstat's data entry structure less time-consuming than StatPac's, since no code book has to be created just to get a single statistic run.

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If I had three wishes for Microstat's next version, I would wish for a code book utility like StatPac's, the inclusion of value labels, and more procedures. You can never have too many procedures. They are of great psychological value. Even if you never use a particular procedure, you usually feel more comfortable knowing it is there, just in case.

NWA Statpak has to be called a statistical smorgasbord.

NWA Statpak (Northwest Analytical, Inc.)

If the first three packages provide basic sustenance, then NWA Statpak has to be called a statistical smorgasbord. There is so much variety in its statistical tables that you are not sure where to start, but you can keep sampling until you are stuffed. It has four different calculations of means (arithmetic, geometric, harmonic, and quadratic), eight different

analyses of variance (two one-way ANOVAs, three two-way ANOVAs, three three-way ANOVAs), and 14 different distribution functions (see chart).

NWA Statpak is different from the other packages in that it can be both command or menu driven—though it's primarily oriented toward command use. It is strongly geared for running single procedures. You are essentially tied to your computer by having to ask for a separate, sequential analysis for each procedure and each variable you want to analyze. Its structure makes it flexible, but considerably more difficult to learn and use.

The impression I get from using this package is that it was designed primarily for interface with already existing data files. It is possible to convert files either to or from the Statpak file format to interface with files created by editors (ED, EDLIN, EDITOR), word processors (WordStar, Final Word, Writeone, and Image), spreadsheets (Lotus 1-2-3, SuperCalc), and data bases (dBASE II and R:BASE). If you have these programs you can greatly increase the sophistication of your data analysis with NWA Statpak. The package seems better designed for this purpose than for original data entry. More space is

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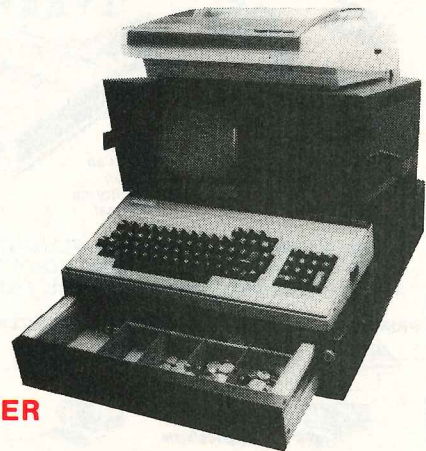
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given in the manual to describing the data translation process than is given to data entry, which should tell you something. At the same time, I had no difficulty using the Speed program to enter my own data and run analyses of it, and I used the Convert program to fool with some data from one of my spreadsheets. Both worked quite well.

One problem I encountered was that Statpak

Systat is like a 17-course meal with subtle sauces and a wine list.

lacks both variable and value labels. This is not terribly serious when you only want a single statistic or a series of runs on a single variable. You are probably going to add the information directly into a report. But for many of us, there is a necessary "shelf life" for data. It sits until we can write an article, then sits again until parts of it can be used in

another article. Unless you hand-label the NWA Statpak data, you will run the risk of having to guess what a particular printout means six months later when you want to expand on what you have already done.

My three wishes for NWA Statpak would be for variable and value labels, optional batch processing, and perhaps just a few more procedures.

Systat (Systat, Inc.)

Systat is the most powerful package I reviewed. It is complex, even intricate. To finish my gustatory analogy, it is a 17-course meal with subtle sauces and an extensive wine list for every course. It contains virtually everything from frequencies to canonical correlation. If your research is of the "one-man band" variety, you can probably get along without Systat by using a mainframe for the procedures the other packages lack. But if you use a team that includes a statistician, make sure the statistician has Systat, even if you don't. Systat should also be high on the "must have" software list of research institutions.

The four packages discussed above can be used

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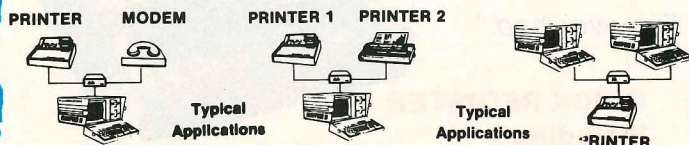
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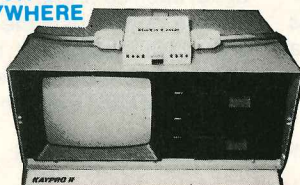
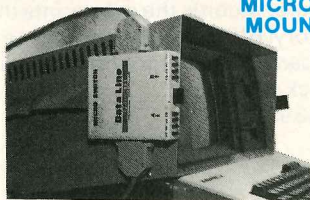
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by those with minimal to moderate statistical skills. The full power of Systat is open only to pros. The fact that you could probably become a pro by spending a lot of time with Systat does not mitigate its complexity.

Overall, Systat compares favorably not just with other micro packages, but with many mainframe packages as well. It is command driven and has a very large set of commands. It has extremely good documentation on the algorithms it uses and their precision, and it provides you with resources for studying them further. It has more plotting facilities than any of the other four packages. Since it is written primarily in FORTRAN, rather than BASIC, it runs faster than the other packages. It is not a package you will be able to use five minutes after opening the cover, but it is one you will still be using five years later.

The most troublesome thing I found with Systat was data editing. You have to know something about programming in BASIC (the more the better) in order to effectively edit your data, even to change a single variable. Data entry also could be far better designed. It is possible to hand-enter data, and, with some experimentation, you should be able to convert some of your files from other sources to use in Systat. The manual recommends using a mainframe, a database, or a spreadsheet to create ASCII data files that can be read by Systat. As long as the files are in the format recognized by Systat, this will work quite well. But the other packages have better solutions to this problem.

I have three wishes for the Systat package, as well. First, I would like a user-friendly data entry system, to go along with the acceptable cordiality of the rest of the package. As a user I am very concerned that data be placed in my files easily and without errors. Second, the package needs a better internal data editor. Finally, and most surprisingly, the package lacks non-parametric statistics. This seems odd in a package that has virtually any other procedure you might ever want or need.

Comparing the packages

The results of my comparisons are summarized in the charts. I set up these charts from the documentation that accompanied the packages, from my use of the packages, and from phone conversations with the companies.

Overall

The programs described in this article warrant serious consideration by professionals. Their documentation ranges from good to excellent. The

procedures offer high levels of precision, and once learned, are at least as easy to use as those for mainframe packages. Each package should handle the data sets for most research projects, though each requires some prior knowledge of statistics. Then again, they are not intended to *teach* statistics; they're designed to let you *do* statistical work conveniently and quickly.

MS-DOS versions

Systat Inc. released a new MS-DOS version of Systat in January 1985 that adds a full screen editor, non-parametric statistics, cluster analysis, and time series analysis, plus four new parametric statistics programs, to the package, without changing the price. If you have a Kaypro 16 or a Kaypro with the "Plus 88" configuration it would be worth researching this new version, since it is designed to overcome criticisms of the package reported in this article. However, the CP/M version reviewed remains unchanged and the criticisms of it are accurate.

Anderson-Bell released a revised MS-DOS version of ABstat in September 1984 that includes the addition of several non-parametric statistics. Otherwise the package remains the same. □

Robert T. Trotter, II, is an anthropologist and Director for Research Development at Pan American University in Edinburg, Texas.

Quick Reference Summary

All of the statistical packages reviewed will run on Kaypro 2s, 4s, or 10s. These companies also have MS-DOS versions.

PACKAGE	COST	COMPANY	ADDRESS
ABstat	\$395	Anderson-Bell	P.O. Box 191 Canon City, CO 81212
StatPac	\$400	Walonick Associates, Inc.	5624 Girard Av. Minneapolis, MN 55419
Microstat	\$375	Ecosoft, Inc.	6413 N. College Ave. Indianapolis, IN 46220
NWA Statpak	\$495*	Northwest Analytical, Inc.	520 N.W. Davis St. Portland, OR 97209
Systat	\$495	Systat, Inc.	603 Main St. Evanston, IL 60202

*NWA Statpak offers an educational institution discount.

Controlling the Real World

New computer peripheral can regulate everyday devices

by Jerry Houston

Editor's Note: This piece represents something most out of character for PROFILES. We have allowed Jerry Houston, marketing director for Remote Measurement Systems, to write about a product that he sells. We have done so for these reasons: First, there are many people who know a lot about the usual products you see reviewed, but there are fewer people who seem to know much about analog-to-digital conversion and control systems (ADCs). Fewer still have the skills to communicate their expertise in writing. After beating the bushes, we haven't found anyone who knows as much and writes as well about this class of products as Houston. Second, we insisted that he present this as an informative overview of ADC technology and its usefulness to you. Though Houston mentions his product, he does so within the informative bounds we prescribed. And he informs you of competing products, including the special capabilities of one particular competitor.

Often a computer owner envisions a project that will perform really useful tasks, dealing with real-world devices, only to give up when he can't figure out how to connect his computer to a security system, a heating system, or even to a temperature sensor. A new class of computer peripherals has emerged that takes care of the concerns of interfacing computers to sensors of all kinds and allows operation of remote devices under the control of the program. Today, your home can be like that of the Jetsons of cartoon fame, with drapes automatically drawn in the evening, the lawn watered when it becomes dry, and heating, cooling, security and safety monitored by your Kaypro.

Data acquisition and control

All this is made possible by a device about the size of a modem. It provides a means for your computer to communicate with the sensors it needs to read and the devices it will control, fulfilling your fondest computer dreams. Such an analog/digital data acquisition and control system frees the programmer to design his system and program, without concerning himself with the details of electronics or communications protocols.

Kaypro computers are ideally suited for data acquisition devices that use RS-232 communications. Control programs may be written in any language that can access the serial port. In fact, the communications ports of Kaypros are very easy to access, due to the way Kaypro has supported the use of `INP(port#)` and `OUT,port#` statements.

Later in this article is a more detailed example of the MBASIC coding used to acquire data and control other devices with the Kaypro 2, 4, or 10. With the added mobility of Kaypro computers, acquisition of data and control of other devices is possible almost anywhere. Instead of a computer owner's collecting data at a remote site, then returning to the home or office to type it into the computer, he can just take the Kaypro itself to the site. Connected directly to the remote sensors, the computer can record all the measurements for later processing—saving a very time-consuming and error-prone step.

"Data acquisition and control" is a catch-phrase being heard more and more frequently among computer users who are involved with security, manufacturing, research, or even home management. In short, data must be acquired by a computer before it can be processed, and many applications require that the computer then be able to control something according to the processing results.

Jobs done by computers of all kinds can be broken down into three major parts: input, processing and output. The input function can be thought of as data acquisition, because raw data—one way or another—must be put into the computer before it can be processed into meaningful information, such as charts, reports, or graphic displays. The term “input” usually brings to mind data entry by conventional means, such as typing on a keyboard or entering files of data from a tape or disk.

Computerized control over real-world events, however, requires that the computer be able to access data from many unconventional sources. A user may want to program his Kaypro to monitor temperatures and soil moisture in a greenhouse, for example, so the computer must be able to read information directly from heat sensors and moisture probes. In addition, the computer should be able to initiate certain actions according to what it reads from the sensors: If it is too cold, heat should be turned on, and if it's too dry, watering should be started. This last is the control function, a particular type of output.

The processing is usually the easiest part of the overall system. Most computer novices could easily write a BASIC program that would:

```
READ temperature
```

```
READ moisture
```

```
IF temperature is less than 70 THEN turn on heat
```

```
IF temperature is greater than 90 THEN turn off heat
```

```
IF moisture is less than 200 THEN turn on sprinklers
```

```
IF moisture is greater than 300 THEN turn off sprinklers
```

The traditional problem, however, has been, “How can I make my Kaypro talk to the sprinkler system?” In the past, this was simple enough for a large corporation with access to systems programmers and electronics engineers. But interfacing microcomputers with other devices had been relegated to the most serious of hobbyists and professional technicians, not ordinary users like the rest of us. Only recent technological advances have made it possible to interface nearly all computers with such real-life devices, easily, and even inexpensively.

Data acquisition and the personal computer

For all the lack of industry standardization, it is fortunate that almost all personal computers do share an important feature: RS-232 communications capabilities. This feature has made it possible to design and market data acquisition devices for PCs by providing a large enough potential market.

There are very few restrictions on the writing of software for these purposes. Any language and operating system that will allow access to an RS-232 serial port can be used to gather data and operate devices under computer control. This includes the very popular BASIC, as well as most implementations of other languages, such as Pascal, FORTH, FORTRAN, C, COBOL, and others too numerous to

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list. For the few languages that do not provide easy RS-232 communications, there are almost always ways to utilize machine language subroutines to open a channel, read a byte, and send a byte, while the rest of the programming is written in a higher-level language.

Details of analog/digital conversion

There are two main types of data available from measuring devices—digital and analog. Digital is the only one of these that the computer can understand, but much practical and useful data comes in analog form.

Digital inputs can assume one of two states, ON or OFF. This is fine for a lot of applications, especially those that can be answered “yes” or “no.” In a security system, for example, it is often only necessary to tell whether a switch has been opened or not. If it's open, an area has been violated. If not, all is secure. Whenever the question involves whether something is on or off, it can be represented by digital data.

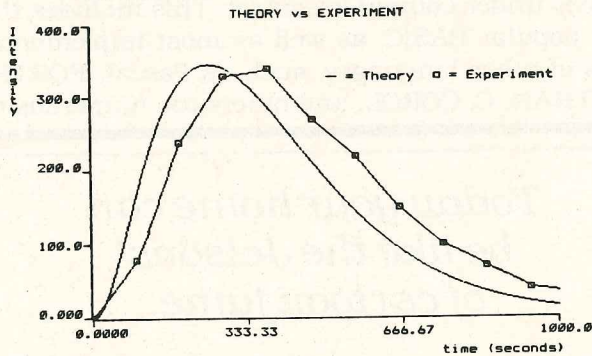
On the other hand, such measurements as temperature, pressure, speed, humidity, acidity, distance, and many others depend on the interpretation of analog data. Analog measurements can answer not only the question “Yes or no?” but also the question “How much?” They do this by analogy—thus the similarity in terms. When we say something is three inches long, what we're really saying is that the object is “like three times the width of the king's thumb.” If we refer to a temperature in degrees Celcius, we're saying that it is some fraction of the way between the temperature at which water freezes and the temperature at which it becomes steam. Thus, we use the analogy of water freezing to determine the zero index for this analog temperature scale.

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System Requirements Any model Kaypro computer driving an Epson, Gemini, or C. Itoh dot-matrix printer.

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DATA CONTROL SYSTEMS

A good many very important measurements can only be made with analog data. The catch, however, is that digital computers—nearly all computers that exist—can only understand digital values. Broken down into the units of data with which the computer works, all information is composed of bits that are either on or off, with collections of these bits used to represent values. Analog data, then, needs to be converted into a digital form for the benefit of the computer; this is called digitizing.

The mysterious term "A/D Converter" (ADC) now begins to take on a clearer meaning. These new devices are designed to accept analog data and convert it to digital data, a form that can be used by the computer. Since they can be designed to communicate directly through an RS-232 communications port, standardized methods of acquiring data can be developed that will work with most computers. Some ADCs also allow the computer to control other devices, either by controlled outputs that can operate electronic or mechanical relays, or by sending high-frequency signals over AC power lines to special control modules connected to AC devices.

Analog-to-digital conversion can be carried out in more than one way, and at various rates and resolutions. All of these factors affect the cost of the equipment involved. Resolution indicates the smallest measurement that can be distinguished from the next. For A/D conversion purposes, resolution is expressed as the number of bits used to contain the resulting digital value.

Some ADCs offer as little as eight bits of resolution, others as high as 16 or more. With 8-bit resolution, a range of measurements can be divided into 256 increments (taking 2 to the eighth power.) Increasing the resolution to 12 bits has a dramatic effect, increasing the number of increments to 4,096 over the same range. Sixteen-bit converters allow for more than 65,000 increments.

For example, consider an application in which the temperature of a kiln is measured over a range of 500 to 2,500 degrees. With 8-bit resolution, that 2,000-degree range could be divided into increments of 7.8 degrees each—perhaps accurate enough for the purpose, but certainly not impressive. With 12-bit resolution, that same range could be expressed in increments of less than half a degree, which might be very important for critical metallurgy. With 16-bit resolution, each mark on the scale could represent 3/100 of a degree, and that's impressive! The tradeoffs involved are speed, accuracy, and cost. Generally, even low-cost 8-bit converters can handle thousands of readings a second, and 12-bit converters operate much more

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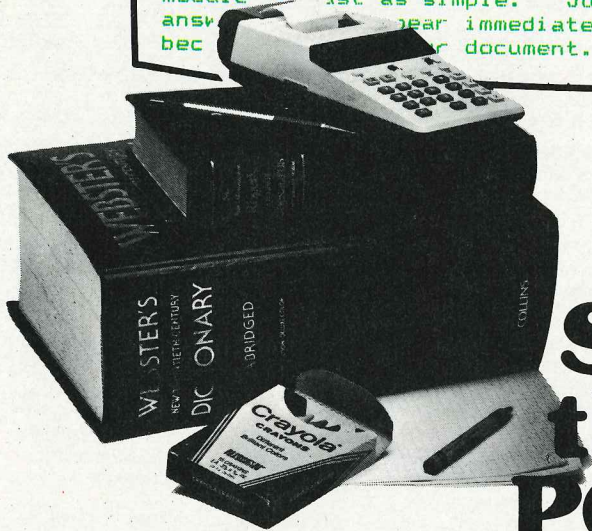
```

A:STARDRIV PAGE 1 LINE 1 COL 01          INSERT ON
<<<      M A I N   M E N U      >>>
--Cursor Movement--      | -Delete- | -Miscellaneous- | -Other Menus-
^S char left ^D char right | ^G char | ^I Tab  ^B Reform | (from Main only)
^A word left ^F word right | ^DEL chr lf| ^V INSERT ON/OFF | ^J Help ^K Block
^E line up ^X line down | ^T word rt| ^L Find/Replce again|^Q Quick ^P Print
--Scrolling--            | ^Y line | ^RETURN End paragraph|^O Onscreen
^Z line down ^W line up | ^N line | ^RETURN End paragraph|^O Onscreen
^C screen up ^R screen down | ^U Stop a/crow and |
-----R-----
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```

THIS OR THIS

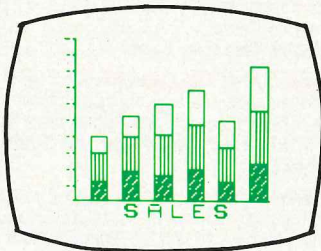


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slowly. Some are changeable, with more accurate and consistent readings at slower speeds, and some loss of resolution at higher speeds.

ADCs that offer both high speed and high resolution are available only at prices that stretch the imagination, and they require similarly expensive computers to deal with their output.

Control function

For an ADC to be really useful, it must also include the "C" part of the name, the control function. The analog/digital conversion provides input to the computer program, and the control function allows the computer to "do something" with the results of its processing.

In many cases, the control function provides for turning another device on or off. A few applications use devices such as stepper motors that can translate digital outputs into various levels of response—opening a valve to a certain position, for example.

Most often, output from the computer is used to turn current to digital outputs (to which electronic or mechanical relays can be connected) on or off. This way, the relatively small currents processed by the ADC can control even large industrial motors.

Another approach is added by the use of power line carrier systems. These allow the ADC to address, under program control, devices that are connected to small solid-state control modules. Signals are transmitted to such modules over the AC power lines, with special codes that can turn on, turn off, brighten, or dim.

A readily available system, called the X-10 system, is manufactured by BSR. Another manufacturer of compatible modules is Leviton, which manufactures industrial-duty versions. Various modules are available for use with most types of AC devices and can be found at hardware or home improvement stores, electronics stores, and many department stores.

ADC's with BSR compatibility are able to address up to 256 separate AC devices at one time. These are divided into banks of 16, or "house codes," to allow separation of a system from another one nearby. This method is a clean, convenient way to have wireless remote control of even heavy-duty devices.

Personal applications

Many applications that were once industrial or commercial in nature are now prime candidates for home use, due to the availability of ADCs and affordable PCs like the Kaypros. One example is certainly the design of increasingly sophisticated security systems for home use.

MAXIMIZE

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Amber Monitor	\$159.95
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EMA Kaypro 10'83	\$82.95
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Because the computer is so good at making decisions, and programming can customize an application so thoroughly, home security now can take on a whole new meaning. A "measured response" can be programmed for each event that occurs. For example, if someone tries to open a bedroom window, it is an easy job for a personal computer to turn on lights progressively closer to the source of the intrusion, at a speed that would simulate a person walking toward the intruder.

With a sufficient number of inputs available, the computer can monitor several areas for security, check for signals from a fire or smoke detector, dial the police or fire department if necessary, and still turn on the coffee pot just before wake-up time. Any Kaypro that's sitting around unused at night can be the nucleus of an extremely valuable security and safety system for the home.

Some folks are spending small fortunes on "smart thermostats" these days, and they really make a good bit of sense with energy costs as high as they are. But a Kaypro can become a Ph.D. among smart thermostats with the addition of an ADC system. With relatively simple programming, the computer can measure the temperature in *all* areas of the house, determine what day it is (weekday, or weekend when everyone is sleeping in), check the weather outside, and control all kinds of heating/cooling devices accordingly. With electric heat, it's easy to have the bathroom all warmed up in the morning by the time the alarm goes off, with the rest of the house kept cool.

I have an old, neglected computer connected to my gas furnace and use it to control temperatures according to a file of parameters. A sequential disk file contains eight set-points per day for the seven days of the week. Because the set-points are used within the computer as a two-dimensional array, it is simple to change the times and temperatures for one day and re-save the file. Normally on school/work days, the first set-point is at 00:00 (midnight), and it is 50 degrees Fahrenheit. At 07:00 the furnace brings the temperature up to 70F, while everyone is showering and getting ready for the day. By 09:00, everyone has left for school or for work, so the temperature returns to 50F.

It stays there until 2:30 in the afternoon and is brought up to 65 in time for the kids to be home from school. At 9 p.m. (21:00) it goes to 50F for the rest of the night. Saturdays and Sundays are handled differently, since no one has to be up at 7 a.m. Also, the furnace can't shut down during the afternoon, as people are home. There's a routine accessible by a function key that allows maintenance of a set tem-

perature (for when someone's home at an unusual time), resetting the times and set-points for a single day, resetting all of them, and other handy functions. The original thermostat is still in the system and set at 75F as a safety limit switch. Ordinarily, the computer should never let the temperature get that high, but if some sort of computer glitch leaves the furnace turned on, the normal thermostat won't allow it to get hotter than 75.

Remember that ADCs are available that control household AC appliances with the BSR X-10 system of control modules. Thus home energy management can easily include shutting off lights when someone leaves the room, waking to the sounds of the stereo, and so on. Best of all, a program can be written to simulate someone being at home during vacations, turning on and off lights and operating other devices, helping to protect against burglary.

There's another area of home use that shouldn't be

A program can be written to simulate someone being home during vacations.

ignored or forgotten: education and experimentation. Most new programmers have dreamed of being able to do "real" things with their computers, and now they're able to. Children can now be entertained and educated with games that do more than light up a monitor screen (e.g., drive a robot), and older youngsters can interact with programming that accomplishes something real.

Commercial (business) applications

With the transportability of Kaypros, many owners use them at home, at the office, and elsewhere for business. The Kaypros that never seem to make it home at night can still be kept busy.

The first applications that come to mind for commercial use are, of course, security and fire protection. Nearly every store, office, or warehouse has a personal computer, at least, and nearly every store, office, or warehouse is left unattended for a good part of each day. In such a situation, the computer should be hard at work protecting the premises whenever the building is empty.

Energy management is important in commercial buildings. A Kaypro with an ADC system can monitor temperatures, light levels, and even actual flow of current through the mains, and take appro-

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DATA CONTROL SYSTEMS

appropriate action whenever something is out of line.

For example, lighting may sometimes be provided by natural light, especially if the building is equipped with skylights, and by artificial lights as well. A simple program would read a number of light level sensors, turn on artificial lights if needed, and turn them off otherwise. When artificial lights are turned on, heating can be balanced by the same program to compensate.

By monitoring the outside temperature as well as the inside temperature, the computer is able to make a judgment regarding how long it will take to raise the temperature a certain number of degrees. Then, when heat is required, it can be turned on earlier on very cold days, or turned on later when the temperature outside isn't much different from the temperature inside.

Traffic monitoring and control are important to many businesses. In some cases, it is sufficient to keep a count of people who walk past a certain point; in others the requirements can get complex. In all cases, a Kaypro with an ADC system can be easily programmed to count the number of people who have stepped on a switch, broken a light beam, or otherwise indicated their presence. Queuing patterns can be analyzed to arrive at more efficient designs for waiting areas and check-out lines, resulting in increased customer satisfaction and more business.

Again, because of their mobility, Kaypros with ADC systems are able to save hours of data entry time for engineers and consultants. They can arrive at a job site, connect the computer directly to the sensors that need to be measured, and enter the data automatically. Otherwise, they'd need to take periodic readings of such things as thermometers, pressure gauges, or speed indicators, record all the data manually, then enter it all by keyboard later.

Industrial applications

Industrial uses for analog/digital data acquisition parallel the commercial applications in many instances and add a few unique aspects. "Industrial," here, is taken to mean manufacturing, and manufacturing generally involves a variety of processes that must be controlled. It is difficult to imagine a more versatile process controller than a Kaypro, provided that it can acquire the data it needs and do something in response.

One of the most important reasons for using a microcomputer for process control is the flexibility that programming it provides. Rather than expensive dedicated machines that perform one task, a computer can be almost instantly reprogrammed to

do a number of jobs, as easily as loading a program from a disk.

There are literally thousands of devices that can be used as inputs to an A/D converter. They can be used to measure speed, measure distances, check tolerances, measure temperatures, determine pressures, and time processes. If a well-programmed Kaypro has access to such inputs, and it is able to initiate actions by way of outputs, then most manufacturing processes can be controlled by the computer accurately, precisely, and repeatably.

Because of the personal computer and affordable ADC systems to be used with it, this kind of process control can now be applied for the first time to small manufacturers. Thousands of small companies throughout the country are now using computerized manufacturing processes, while a few short years ago most were still doing even their accounting by hand. In addition, a rapid increase in distributed data processing is causing the data processing functions for large plants to be split up among the areas that need the DP capacity, rather than doing it all in a central DP department. Even large companies, then, are becoming involved with

Kaypro-sized computers to operate their manufacturing processes.

An interesting area of industrial application is the use of computers to perform jobs that are inefficiently done by human workers, or that are overly boring or hazardous. Microcomputers with ADC

Computers can do jobs harmful to humans.

systems have been implemented to keep running records of temperatures generated by certain processes; previously a person was paid to work all night just to record one temperature each hour.

The computer seldom if ever makes mistakes that are its fault, and it never gets bored and starts daydreaming. It doesn't have good days or bad days, regardless of what some programmers say, so it can offer consistent quality. A computer can measure

(continued on page 91)

XtraKey out "keys" the competition!

Thinking about buying a "key" program? (You know, the names all start with words like "smart", "magic", "pro", etc.) Looking for a faster, easier way to calc, or process words or databases? If so, then you owe it to yourself (and your Kaypro) to check out XtraKey. Quite frankly, we think it's the best of all the "key" programs. At any price! (And wait 'till you see our price.) Just like other "key" programs, XtraKey lets you redefine your regular keyboard keys to be anything you want. A word, a paragraph, a series of commands . . . whatever you hate to type over and over again! Close a letter in split-seconds. Log onto bulletin boards at the touch of a key.

Create instant "macros" for database programs. You can change, use or make up new definitions anytime. Even while running a favorite program like WordStar or dBASE III!

Unlike other "key" programs, XtraKey can redefine your Kaypro's numeric keypad or cursor keys directly without complicated configurations. And there's no limit on definition lengths. Plus our advanced XShift feature lets individual keys have up to 16 meanings without losing their normal functions! XtraKey can even talk to your printer or video display. Change from regular to compressed type while working on a spreadsheet. Address an envelope while editing a document. Or call up your own custom help or menu screens (almost like having windows!)

There's more! Built-in print screen (screen dump) function . . . no need to install a special chip and void your Kaypro's warranty. Built-in batch processing. Automatic definition file loading. Backspace error correction. Input pause. All in one, neat little package that uses less memory AND disk space than other "key" programs.

XtraKey is easy-to-use and includes a 70 page manual. No installation required.

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XtraKey and XScreen will run on all Kaypros that use CP/M 2.2. To order XtraKey, send check or money order for \$49.95 plus \$3.00 shipping (U.S. & Canada). To order XScreen, send \$24.95 plus \$2.00 shipping. California residents MUST add 6% sales tax. Inquire on foreign orders. Specify Kaypro 2 (SS/DD) or Kaypro 4 (DS/DD) disk format. VISA and MasterCard accepted (provide card number, bank number and expiration date). All orders please include telephone number.

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Technical Forum

by Tom Enright

You'd think that buying something as basic as a printer would be a pretty simple proposition. Wrong! You have to be a graduate engineer to figure out what the specification sheets are saying. Not only do you have to decide between dot matrix or daisywheel, you have to know whether you want a parallel or serial interface. Say what?

A lot of people get confused when it comes to figuring out which interface is better. The answer is "Neither one." Whether you should use parallel or serial boils down to *where* you put the printer. If the printer is going to be within about 20 feet of the computer, parallel is the easiest way to go. The only time you have to use a serial printer is if the printer is going to be more than 20 feet from the computer. Being able to put the printer farther away from the computer is the only advantage a serial interface has.

Our discussion will be limited to the characteristics of parallel and serial interfacing. Questions of dot matrix versus letter quality and what features you need are too individual to deal with here. For the rest of this article, the term "parallel" is taken to mean Centronics Parallel and "serial" refers to a RS-232C serial interface. Other interfacing standards exist, but most users will rarely encounter them.

Overview

The first thing to get out of the way is the difference between a parallel and serial printer. The distinction is made in how data are sent to the printer. Simply stated, serial means one thing at

a time and parallel means several things at once. In this case the "things" are binary bits that make up the data you want to print.

As you may have heard, a computer's memory capacity is measured in bytes. A byte is made up of eight bits, or digits. A reasonable example would be the binary pattern 01000001. This binary pattern can mean the number 65 or the letter A, depending on how it is used later on. For our example we will use the letter interpretation, the uppercase letter A. What you should notice is that it's made up of eight digits. That is the whole key to understanding serial or parallel interfacing. A parallel interface sends all eight bits at once, while a serial interface sends them one bit at a time.

Parallel printers

To send the letter A to a parallel printer, all eight bits of the byte are sent at once, over eight separate data lines. That's why a parallel cable is usually thicker and more expensive than a serial cable—it has more wires in it. Now, the parallel cable has more than eight wires. It has several additional wires used for communicating other information back and forth between the printer and computer. There is no reason to memorize what each and every wire does. Just remember that a parallel cable has more wires than a serial cable.

Also, remember that a parallel interface sends all eight bits of the data byte at the same time. Another characteristic worth remembering is that Centronics Parallel interfaces operate at TTL (Transistor to Transistor Logic)

voltage levels. All that means is that its signal is sent as alternate +5 volt and 0 volt signals. The +5 volts means a 1, and 0 volts means a zero.

TTL voltage levels are the major limiting factor in a parallel printer. Because the signal starts out at a fairly low voltage level, it can only travel over a limited length of wire before it becomes too weak to read at the other end. For that reason a parallel printer shouldn't be more than about 20 feet away from the computer. Most personal computer users prefer to have everything close together for convenience, so this isn't a significant limitation.

Hooking up a parallel printer couldn't be easier. Plug the data cable into the printer and the parallel port of your Kaypro. Make sure the power cable is plugged into the wall and the paper is inserted correctly. That's it. All Kaypro computers come with the parallel port already selected for printer output. There's no messing around with the cable; it will only fit one way. You don't have worry about connector pinouts or anything else. Just plug it in and use it.

Serial printers

With a serial printer, the eight bits of the data character are all sent over the same wire, one at a time. Inside the computer everything is moved in parallel. So, to send something serially, the computer has to take the data byte apart and send the bits one at a time.

The advantage of a serial interface is that RS-232C signal levels are a good deal higher than TTL levels. Serial signal levels are -12

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The Kaypro manual states, 'Line filtering will protect your Kaypro... from power surges or other undesirable occurrences from the power source.' Surge protection will help your Kaypro provide years of trouble-free service. Also, if you plan to use your Kaypro to access information by modem, you must have a reliable high frequency noise (EMI/RFI) suppressor to insure against data loss and scrambling.

There are many "toy" surge suppressors on the market. They are smartly colored, but beware. The performance difference is amazing. The best surge and noise suppressors on the market are made by Panamax. Our "Panamax Challenge Certificate" tells all. It is a startling comparison of Panamax quality with 11 other well-known brands. One aspect of this revealing report tells how Panamax responds to and cuts surges in 5 or less pico seconds, while most other suppressors respond at a comparatively slow 5 to 50 nanoseconds!

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your keyboard, software commands are only a glance away, at your fingertips. This makes it easy to learn programs that come with your Kaypro. Stop going back to the book to get a software command. Now you can learn software commands super fast, so you can make better use of your powerful programs. The expertly organized Wordstar/Mailmerge template, for example, gets you into word processing in half the time. A special dBase II template cuts through the learning curve like a knife and gets you programming sooner. Kleertex templates for CalcStar, Perfect Writer/Filer and Perfect Calc get you moving fast on these programs too. Once you try Kleertex templates, you'll wonder how you ever got along without these useful tools. Central's special price for one template is \$17.95. Choose any two templates for \$34 and save. If you like, you may combine purchase of any of these four templates for super savings. Complete satisfaction is guaranteed or money-back. Makes learning software a breeze. Great value. Order today.

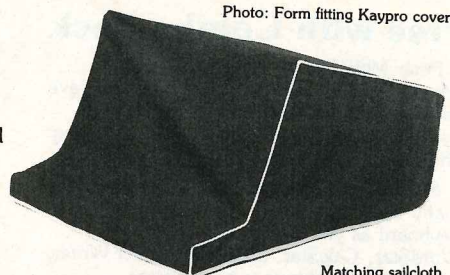


Photo: Form fitting Kaypro cover.

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D: Connects direct to grounded wall jack.
LC: Includes 6 foot long heavy duty line cord.
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Photo: Panamax 6 outlets LC S RB NF.

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Peter McWilliams, William Buckley, Steven Frankel, and a cast of thousands rave about how **SmartKey II** speeds up and improves accuracy in computing by reducing often used multiple keystrokes to single keys.

Smartkey II lets you easily reprogram as many upper and lower case keys on your keyboard as you want, even while WordStar, CalcStar, dBase II, Perfect Writer, or any other software is in operation.

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SmartKey II has a little known super companion program called SmartPrint II. SmartPrint II retails at \$49.95. SmartPrint lets you give single-stroke commands to your dot matrix printer to make it produce italics, graphic symbols, boldface, underlining, extended typefaces, accent marks, and much more. SmartKey II retails at \$89.95. Now, for a limited time only, Central's **SmartKey II Plus** and **SmartPrint II Plus** **combo pack** is only **\$79**. In addition, as a bonus, with your purchase you will get a **free** copy of Paul Golding's book, *Screen Smarts, The Computer Tamer's Guide*. This book is a \$15.95 value. It tells how Mr. Golding, a professional writer, uses SmartKey II to turn his humble computer into a supercharged dedicated word processor. Please don't delay, this offer may not be repeated. Order today to get SmartKey II Plus, SmartPrint II Plus, and a free copy of the newly revised edition of *Screen Smarts, The Computer Tamer's Guide*, lightning fast.

Warning: SmartKey II makes lesser programs look dumb, dumb, dumb. Comes with step-by-step manual.

Stop Tearing Up Your Disk Drives

If you're using your Kaypro as a printer buffer instead of a computer, you may be tearing up your disk drives. Disk drives are mechanical devices, they are often the first parts of a computer to go sour. No wonder. Everytime you feed your printer a file, the drives whirl madly until the printer has accepted the entire file. Sometimes this takes a long, long time.

If you're tired of hearing your disk drives grind down, you need a printer buffer. The best performance and price buffer on the market is the Consolink MicroSpooler. This computer-like tool absorbs files as fast as your computer can send them, and then patiently feeds or spools them to your printer a few bytes at a time.

The MicroSpooler is an intelligent, feature-packed buffer. It is easy to install and operate. Merely place it between your computer and printer, then connect it with two cables, and feed files as large as 64K within seconds to your letter quality or dot matrix printer. The instant the transfer is complete, you can operate your computer again. The MicroSpooler does the rest.

The MicroSpooler comes in a variety of configurations. You can link your Kaypro to any popular printer with two inexpensive cables. Please check our low MicroSpooler prices. You won't find a more feature-packed or reasonably priced spooler around. Try the MicroSpooler of your choice for 15 days. If you are not completely satisfied with your purchase, return it for an immediate full refund. Your Kaypro deserves this attractive and useful accessory. Order a compact and powerful MicroSpooler for your computer today. Works with all model computers.

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The Kaypro can dump a file faster than a printer can accept it. This device will catch the file, quiet the disk drives, and let you compute again.

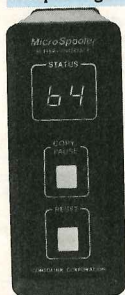


Photo: MicroSpooler 64 K P-P

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Description	List	Price
64 K P-P	\$315.00	\$279.95
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Two Cables	\$ 56.00	\$ 29.00

64 K	Stores and spools files as large as 64 K.
P-P	Parallel Kaypro port to parallel printer port.
P-S	Parallel Kaypro port to serial printer port.
S-S	Serial Kaypro port to serial printer port.
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Cables	Set includes one special male to female connector and one male-male connector. *Please tell us model and type of printer you're connecting to your computer.

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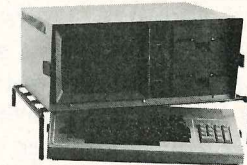


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volts for a logic 1 and +12 volts for a logic 0. Since the signal starts out stronger, it can travel farther and still be understood at the other end. This lets you put the printer 75 or more feet away from the computer. That's about the only advantage to a serial interface, and, it is far outweighed by the hassle you'll have hooking it up to your computer.

The hassle of interfacing a serial printer breaks down into three components: the physical wiring of the interface, data format, and transmission speed. Both ends of the connection have to agree on all three items before the system will work.

Physical handshaking

The so-called RS-232C interfacing standard defines which of 25 signals should be present on which pins of a DB25 connector. It only *recommends* which signals go to which pins; it doesn't require that all signals be used. The RS in RS-232 stands for Recommended Standard. No one has to comply with it. This leaves manufacturers pretty much on their own as to how they implement the interface. The bottom line is that you have no guarantee that any serial printer will use all the same signals that the computer does.

The only thing that you can count on is that if both devices use a particular signal, and both devices are the same type, the

signal will be found on the same pin at both ends. Notice that I said if both devices are the same *type*; RS-232C comes in two flavors—DCE and DTE. DCE is an acronym for Data Communications Equipment and DTE means Data Terminal Equipment. At this point things start to get confusing, so perhaps a little background material is in order.

The RS-232C standard was originally meant to deal with terminals and modems. Terminals are DTE devices and modems are DCE devices. The whole idea was to specify a standard for hooking these two types of devices to one another without a lot of hassle. The standard specified that a DTE transmitted on pin 2 and received on pin 3. It also specified that a DCE device received on pin 2 and transmitted on pin 3. The idea was that, if the standards were complied with, a standard straight-through cable could be used. The other 24 pins were named for signals used by modems and terminals. Printers never came into the picture.

Those were the days when computers were room-sized behemoths attended to by legions of white-coated technicians. Anyone who had to deal with hooking up two devices was expected to be a professional who understood the vagaries of alternate signals and serial interfacing. The standard was written by programmers for programmers, and only they could figure it out.

Most microcomputer owners aren't hackers or programmers. But they are still stuck with the same confusing and contradictory RS-232C standard that the rest of the industry has to put up with. Nobody has been able to get

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manufacturers to agree on a workable serial interfacing standard that can be applied to all serial devices.

If you are going to hook up a serial printer, you're stuck with either learning how to do it yourself, or depending on your dealer. All too often the dealer doesn't know any more about it than you do. Then you end up having to find someone who knows both the computer and the printer to make a special serial cable for you.

I can't tell you how to hook up every serial printer to your Kaypro. There are just too many variations in the pinouts of available printers to do that. The best I can do is to give you the pinouts for Kaypro serial ports and recommend a couple of good books on serial interfacing. Kaypro serial pinouts are:

Kaypro '84 series computers

Serial Printer Port (DCE)

Pin 1— Chassis Ground

Pin 2— Receive Data

Pin 3— Transmit Data

Pin 7— Signal Ground

Pin 20— Data Terminal Ready

(Used as printer busy)

Serial Data Port (DTE)

Pin 1— Chassis Ground

Pin 2— Transmit Data

Pin 3— Receive Data

Pin 4— Request to Send

Pin 5— Clear to Send

Pin 6— Data Set Ready

Pin 7— Signal Ground

Pin 8— Data Carrier Detect

Pin 20— Data Terminal Ready

Kaypro '83 series computers

One serial port, same as Serial Data Port on '84 series.

Kaypro 10

Same pinout as '84 series. Note

that the ports are labeled with slightly different names.

Kaypro Robie

Same as '84 series.

Two very good books on serial interfacing are:

The RS-232 Solution

by Joe Campbell

Sybex, Inc.

RS-232 Made Easy

by Martin D. Seyer

Prentice-Hall, Inc.

These books provide an excellent understanding the problems of serial interfacing. The subject is really too complex to deal with in a magazine article.

Data format

In any serial interface, once it's wired correctly, information is transmitted one bit at a time. There are also several options on how the data is sent. Some printers that have graphics capabilities need eight bits of information to do graphics. But standard written text only needs seven of the eight bits. So a serial interface lets you choose seven or eight bits of data, an optional parity bit, and at least one stop bit.

The parity bit offers a crude form of error checking that was originally designed for use with modems and really doesn't apply to printers. However, it still has to be specified. Valid parity choices are even, odd, or none. Even parity requires that each data byte have an even number of 1s in it. If the byte has an odd number of 1s, an extra 1 is added after the data byte to make an even number. Otherwise the parity bit is a zero. Odd parity is just the opposite— an odd number of 1s is required.

With no parity, the parity bit position just isn't used.

Finally, both ends of the connection have to agree on is how many stop-bits are used. One is usually sufficient. Just make sure both devices are using the same number.

Transmission speed

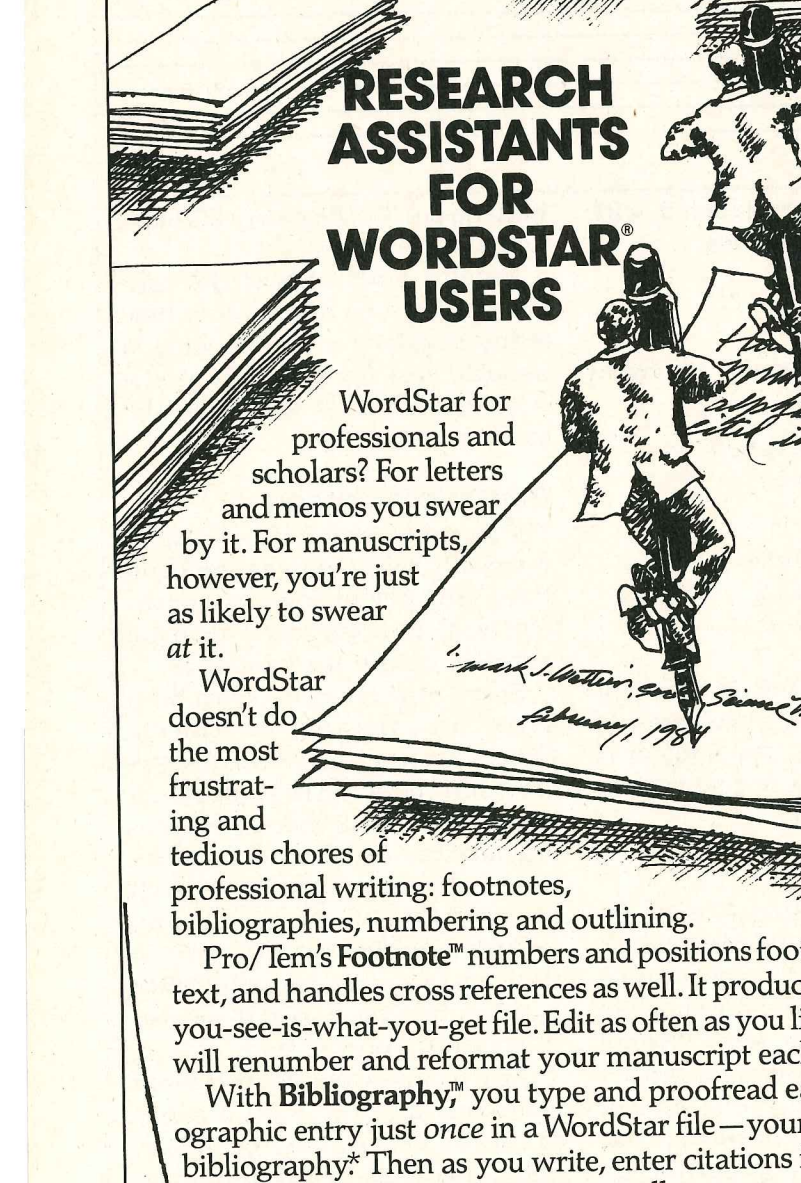
The speed at which data are sent is usually referred to as the baud rate. "Bits per second" is the correct term, but everyone else in the industry calls it the baud rate.

Some printers come with both serial and parallel interfaces. Others come with a parallel interface, and the serial interface is an option that costs more. Still others have two levels of serial interface: a slow one (up to 1200 baud) that comes with the printer, and an optional high-speed interface that costs extra. Usually 9600 baud is as fast a serial printer interface as you will find.

Any number of different baud rates can be used with a serial printer as long as both computer and printer are using the same speed.

Conclusions

Sounds like a lot of work just to hook a printer up to your computer doesn't it? You're right, it is. There is no compelling reason to use a serial interface when the printer will be close to the computer. Parallel is so much easier. Serial interfacing means getting involved with specially wired cables, data format, and baud rate. It's just not worth the trouble unless the printer has to be 100 feet away or only comes with a serial interface. □



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Book Review

by Dick Lutz

At \$9.95, it's a bargain. Robert A. Froehlich's reworking of the CP/MUG and SIG/M public domain software catalogs is a hassle-free way to pin down lots of random information about "free" software, electronic bulletin boards, software copying services, and assorted miscellany—all that stuff about which you might one day wish you'd saved clippings.

Therein lie both the virtue and one shortcoming of *The Free Software Catalog and Directory*: Publishing cycles being what they are, the book is incomplete and necessarily includes information that is obsolete even before it reaches store shelves. Though the essence and value of the book involve its lists of public domain programs, those libraries are being expanded and revised even as the presses roll. Bulletin boards are shutting down or changing phone numbers and new ones are coming online.

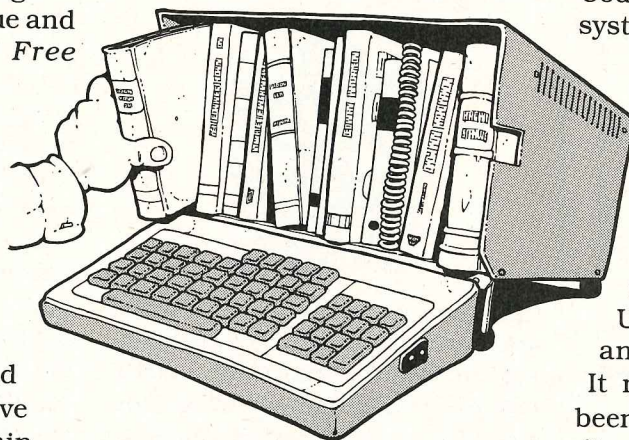
It's an excellent place to start, however, and the book promises to be worth acquiring in annual or biannual updates, particularly if Crown Publishers can hold the line on the price while Froehlich does some fine tuning in the book's organization and presentation.

Raw data and indices

In 180 of the book's 475 pages, the descriptions of 5,000-plus files appear—some 40 megabytes of public domain material. Each file is identified by library disk number and program number,

file size, author and revisor names, the language (of original creation or required compiler or interpreter), indexing keywords, and a short description. Separate indices allow the user to access this raw data by keyword, lan-

The Free Software Catalog and Directory



guage, author, or filename. The first and last are most useful.

For example, if you're on the trail of material useful in computer-to-computer communications, the keyword "communications" takes you to a page and a half of sub, sub-sub, and sub-sub-sub category listings: bulletin board programs, modem controllers, file squeezer/unsqueezers, and more. Sometimes the program names are given (which can be usefully informative or maddeningly obscure), but more usually the keyword is followed by just disk and program numbers. Unfortunately, this means you have to turn frequently from index to catalog pages and back.

Many keyword listings are adequately informative, military-style, with entries like this one:

"text files, transfer, modem, modem," which really means "modem-to-modem transfer of text files." Others make you wonder: "patch, YAM, disable SYS files," which turns out to be the entry:

S136.15 PATCH.YAM 2k [29 80]
Gray, Ian/a. {communications, patch, YAM, disable SYS files}
Code for a YAM patch to disable system file access.

If this leaves you in the dark as to what SIG/M disk #136, file #15 is, you're not alone. Some poking around at the other files on disk 136 reveals finally that it's a disk of "Big Board Utilities, Modem Patches, and LISP Documentation." It makes you wish that had been made clear in the keyword directory, saving you thumbing from page to page. This is one area where the next edition can use fine tuning.

Sometimes the reward for a diligent search is not very great. Looking up SWEEP by program name, for example, tells you only that it's a "Multi-featured disk maintenance utility," and you might wish for more, especially since the description of WASH is exactly the same. This makes it hard to make a selection. The listings for other versions of WASH tell you, in adjacent entries:

"Almost all-inclusive routine to make it easy to do disk directory housekeeping. Features very fast copy, and all directory and disk I/O is handled through calls to BDOS, for complete compatibility...contains extensive



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Book Review

error message reporting, a circular buffer 'wraparound' file list, and is designed for speed, small size and compatibility with any CP/M 1.4 or 2.2."

That's more like it, but it still doesn't help you decide between WASH and SWEEP. Fortunately, another section of the book, selected program documentation, provides a whole page of



information on SWEEP's features and how to use them—but nothing on WASH. Two dozen other popular public domain programs are well documented in this section, and it should be expanded. Moreover, it should be referenced in the short descriptions section to inform readers of where more detail appears.

A similar lack of thorough descriptions plagues other entries, but as frustrating as that can be, there's usually enough information to allow you to determine whether or not you want to acquire the disk. Documentation files on the disk should clear up any remaining questions.

How-to section

The first 60 pages are a treasure trove of useful information, mildly dense in its presentation and occasionally whimsical in its organization. For example, an "Overview of the User Group Libraries" and "Using Source

Files" are combined into one chapter. The information within that chapter, however, is most valuable to those for whom the filetype ASM is the equivalent of a stop sign.

These first chapters gather into one place useful information on a host of subjects, including disk management, machine-to-machine transfer, copying services and how they work, public domain software disk rental services, accessing electronic bulletin boards to download programs and types of bulletin boards.

One section, for example, hand-holds the reader through the assembly of a source file, emphasizing the "try it—you can't hurt your computer" approach so necessary to crossing the boundary between clean bundled software and the murky world of sometimes-buggy public domain programs.

And more...

A listing of bulletin boards by area code and computer clubs by zip code holds out a helpful hand to the microcomputing newcomer.

Despite its shortcomings, *The Free Software Catalog and Directory* is a useful, fairly priced key to the door of public domain software. Unless you've been maintaining your own careful update of the CP/MUG and SIG/M software catalogs, it's a real bargain. □

The Free Software Catalog and Directory, by Robert A. Froehlich, 475 pages, large paperback, \$9.95, Crown Publishers, Inc., 1984 New York NY.

New Products

by Susan Hyman

The following new product listings are not reviews, and should not be considered as endorsements of tested products. We have looked at some of the products, but do not necessarily have hands-on experience with them.

To be considered for publication in "New Products," press releases and product information should be sent to: New Products Editor, PROFILES Magazine, Kaypro Corporation, P.O. Box N, Del Mar, CA 92014. All releases must state which Kaypro machines the product works on and must include the price, or they will not be used. Send black-and-white photos if available.

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Excalibur Plus™ also incorporates its own fourth-generation programming language called ARC®, which is task-oriented rather than procedure-oriented. This language also provides online help facilities and ready-to-use complex functions. These modules are all compatible with

dBASE II and Framework database programs.

The price is \$595 per module, except the Customer Information and Depreciation modules, which are \$295 each.

Armor Systems, Inc., 324 North Orlando Ave., Maitland, FL 32751 (305) 629-0753.

dBASE II utilities.

dB/INDEX and **dB/DEBUGGER** are two new programs that help the dBASE II user.

dB/INDEX is a library of routines that can INDEX, SORT and PACK dBASE II data files much faster than dBASE II. It also includes a program that can repair some damaged databases. The dB/INDEX routines can be operated as stand-alone modules, or they can be called from dBASE II programs.

dB/DEBUGGER is a symbolic debugger for programs written in the dBASE II programming language. dB/DEBUGGER lets programmers set execution break points by file and line, automatically enter debugging mode after a run time error, list and modify memory variables and database items, list dBASE source code from any file and any number of lines, and invoke an online help menu. dB/DEBUGGER also includes a data generator.

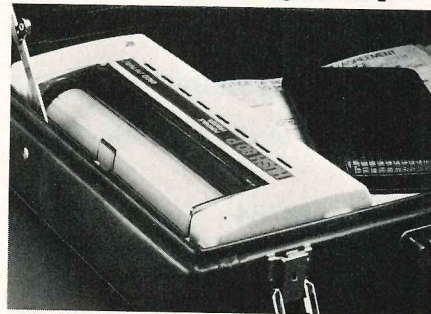
dB/INDEX is \$120 and dB/DEBUGGER is \$240.

WordTech Systems, Inc., P.O. Box 1747, Orinda, CA 94563 (415) 254-0900.

Low-priced printer.

The **HUSH 80** dot matrix thermal printer is a small, briefcase-size printer that can run on batteries or electrical power.

Weighing only three pounds, the HUSH 80 has 80-column, bidirectional printing at a speed



of 80 characters per second. Its dimensions are 11.6 X 5.5 X 2.8 inches, and it has a graphics output of 4,800 dots per square inch. All models include a 100-foot roll of thermal paper housed internally and a nine-volt AC wall transformer with power cord.

\$139.99. Ergo Systems, Inc., 26254 Eden Landing Road, Hayward, CA 94545 (415) 786-3746.

Book explains electronic mail.

Designed to help managers and other professionals implement electronic mail systems in their offices, the book *Options for Electronic Mail* explains and compares the major types of electronic mail services and provides readers with a practical understanding of this technology.

The authors cover these areas: computer-based message systems (CBMS), the international telex and TWX network, distributed or local electronic mail networks, the various telecommunications options, software packages available, interconnection services for different electronic mail systems, the future of electronic mail, and more.

The book was written by Libby Trudell, marketing manager at

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- Turbo Pascal review
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- Education with PILOT
- Computers and literacy

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- The making of 2010
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November '84

- A look at DataStar
- Nevada COBOL review
- Freelance programming

December '84/January '85

- Stocking stuffers
- Modem roundup
- CP/M vs. MS-DOS

New Products

Dialog Information Services. Two contributing authors were Janet Bruman and Dennis Oliver.

\$24.95 softcover; \$32.95 hardcover. Published by Knowledge Industry Publications, Inc., 701 Westchester Ave., White Plains, NY 10604 (914) 328-9157.

Perfect Writer formatting help.

WORKBOOK.FIN is a written guide to formatting with Perfect Writer. It includes step-by-step methods for setting style parameters, printing to console and file, using headers and footers, creating tables, and more. Examples show documents before formatting (commands visible), along with the formatted result. The last chapter tells how to use Perfect Writer without menus.

\$12. Triple L Manuscripts, P.O. Box 177, Monmouth, OR 97361.

File-dating facility.

The software program **DateStamper** automatically stamps any file with the date it is created, last read or modified. And if you have a Kaypro with a real-time clock, the exact time your file was stamped will also be recorded.

The DateStamper requires the enhanced CP/M 2.2E operating system available from PluPerfect Systems. Users can exclude particular files from being dated if desired. Disks initialized for date-stamping are also compatible with unmodified CP/M 2.2 operating systems.

With DateStamper utilities, users can view screen directory listings of the names and sizes of files with the dates and times they were last accessed. This program can also handle files using

wildcard filenames.

\$39. PluPerfect Systems, Box 1494, Idyllwild, CA 92349 (714) 659-4432.

Full-featured communications software.

ENVOY is an easy-to-use menu-driven communications package for microcomputers. It allows a computer to be used as a smart terminal for accessing time-sharing services or electronic mail and provides high-speed file transfers between computer systems. This software also can communicate with public networks such as The Source or CompuServe, and contains utilities that let the user erase, copy, type, rename and print files with a single keystroke.

Other features include a large capacity buffer, autodial and autolog-on capabilities, XMODEM and ANSI file transfer protocols, and more.

\$49.95. ARTISOFT, Inc., P.O. Box 41436, Tucson, AZ 85717 (602) 327-4305.

WordStar booster.

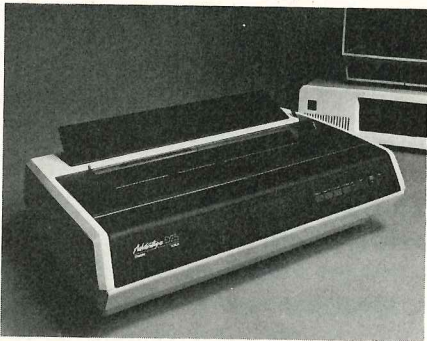
The software program **STAR-DRIVE** adds four integrated tools to WordStar: graphics, math calculations, spelling checker and electronic thesaurus.

The graphics portion produces bars, lines, pies or math functions inside WordStar text. The user simply inserts the name of the graph surrounded by brackets in the text. Another tool lets users do math calculations. The spelling checker has a 100,000-word dictionary and lets the user add his own words. The electronic thesaurus has 72,000 words. One simply places the cur-

sor on the word and presses a key to get synonyms to appear.

STARDRIVE lets users switch among all these functions without leaving WordStar and requires at least 250k per drive.

\$200. Robonics, 936 Hermosa Ave., Hermosa Beach, CA 90254 (213) 316-7740.



Letter-quality printer.

Designed for heavy office use, the new Xerox/Diablo Advantage D25 daisywheel printer has automatic proportional spacing, carriage returns and bidirectional printing.

With a print speed of 25 characters per second, the D25 offers variable line and column spacing and automatic paper loading. The D25 also accommodates a tractor and single-sheet feeder.

\$745. Xerox Corporation, Xerox Square 006, Rochester, NY 14644 (716) 423-5078.

Microcomputer pricing guide.

Designed to meet the information needs of the financial community, *The Brown Book* lists prices of microcomputer systems, printers and monitors. Issued quarterly, *The Brown Book* lists suggested retail, average advertised and "Brown Book" prices for more than 600 products from 200 equipment manufacturers.

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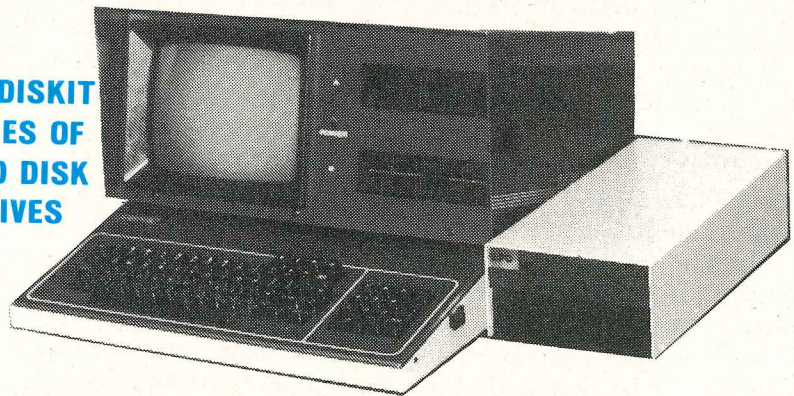


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New Products

The book does not, however, attempt to evaluate the merits of the manufacturers—it simply reflects current pricing trends.

Companies can use the book to establish current values of equipment they have, determine the best prices for new purchases and calculate resale values. Businesses can also use the values given for bank loans, financial statements, insurance claims, lease terms and liquidations.

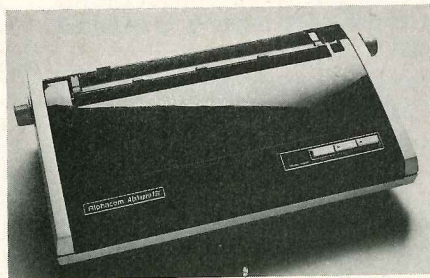
Subscriptions are \$375 for 18 months; the first issue available is January-March 1985.

Fred Brown Associates, P.O. Box 3490, Santa Barbara, CA 93130 (805) 687-1140.

Printer adapts to different computers.

The **Alphapro 101** letter-quality printer employs an intelligent printer cartridge that adapts it to most personal computers, including those with RS-232 or Centronics ports.

The 20 character-per-second daisywheel printer uses standard Diablo and Qume-compatible printwheels and ribbon cartridges. It supports true proportional spacing, boldface, double strike, strikeout, phantom space, superscripts, subscripts and reverse line feeds. The Alphapro 101 can accommodate paper up to 13 inches wide and has a 93-



byte memory buffer.

The printer comes with ribbon cartridge and printwheel and is covered under a one-year warranty.

\$399.95. Alphacom Inc., 2323 South Bascom Ave., Campbell, CA 95008 (408) 559-8000.



Business letters on disk.

Businesses can now cut down on time spent writing letters with the new software package called **Gold Letters and Gold Writer**.

Gold Letters is a collection of 101 business letters designed to work with almost any word processing program. These letters encompass 13 categories: credit collection, sales and marketing, customer relations, employee relations, credit terms, shareholder relations, community activity, media relations, services, personal business, internal memos and special situations.

The program comes with a binder holding a printout of each letter. Letters are called up via your own word processor or the one included with the package, Gold Writer. These letters can then be edited as needed.

\$99. Data Base Industries, 1555 North Cuyamaca, El Cajon, CA 92020 (619) 448-2121.

Disk format conversion software. UniForm CP/M for Kaypros can

translate IBM PC-DOS data diskettes into CP/M format and vice versa. UniForm CP/M does so by transforming one floppy disk drive of the Kaypro into a PC-DOS drive to read, write and copy data diskettes, as well as copy data from the CP/M diskette to the IBM diskette.

This program comes with online help facilities, error message display and documentation.

\$69.95. Micro Solutions, 125 South Fourth St. DeKalb, IL 60115 (815) 756-3411.

Directory of online industry professionals.

A unique resource for telecommunications specialists and subsidiary markets is available in the newly released book, *Marquis Who's Who Directory of Online Professionals*. The publication contains more than 6,000 professional profiles representing every part of the field, including intermediary searchers, information managers, database product and services producers, and end users.

In each person's profile the following facts are listed: online expertise, current monthly online usage, equipment used, database subject expertise, databases used, professional affiliations, articles and books written, career training information, and address and phone number.

Multiple indexes enable directory users to locate individuals by subject of expertise, online function or geographic area. Professionals from 47 nations are listed in this hardbound volume.

\$85. Marquis Who's Who, Inc., 200 East Ohio St., Chicago, IL 60611 (312) 787-2008. □

the temperature of decaying sewage without complaining about the smell.

Research applications

Here are a few interesting research applications for personal computers that are being used with ADCs.

- ▶ A Western university is beginning research that will use a microcomputer and an ADC system to record stability and stresses of a ship model as it is exposed to wave action in a testing tank.
- ▶ A researcher in the Caribbean uses a portable computer to measure changes in the magnetic fields within the crater of a volcano that last erupted in 1979. Changes in these fields represent the underground movement of magma and are possible precursors to another eruption.
- ▶ That same computer-and-ADC combination is used in a paper company laboratory, where moisture sensors inside baby diapers provide data that may lead to better quality disposable diapers and drier, happier babies.
- ▶ A researcher is studying the nutritional requirements of seagulls, including weighing them without capture, to determine the relationship of food quantity to weight gain. His portable computer is connected via an ADC system to a small scale. Seagulls love to perch on the scale because it allows them to see better past the tall grass. The computer re-zeros the scale every 15 minutes or so, to account for any foreign matter that the seagulls might leave behind.

Program coding

It's easy enough to say that data acquisition and control are simple, but take a look at the following sample program and see for yourself. Although I've chosen to keep this article non-specific as to equipment, it is necessary now to specify that the unit referred to below is the ADC-1 analog/digital data acquisition and control system from Remote Measurement Systems of Seattle. It's used as an example here because of my familiarity with the device and because it includes analog and digital inputs, digital outputs, and a transmitter to send control codes to BSR-type modules, all in one package.

Of all the above-mentioned features of the ADC-1, the analog inputs section is the most complicated to deal with, so we'll start with that. Operating any of the functions of the ADC-1 is a matter of sending a command byte to the device and receiving a data byte in return. Since the resolution of the ADC-1 is 12 bits plus sign and status bits, the results of an ana-

Sample Program Listing

```

100 OUT 0,12 ;baud rate set
110 X = INP(4) ;clear port of old character
120 GOSUB 5000 ;channel start, read subrtin
130 PRINT "VALUE = "; VAL ;prints results
5000 OUT 4,10 ;set channel, start a/d
5010 GOSUB 5200 ;wait for entire byte
5020 DIGINP = CHARIN ;return byte contains status
;of digital inputs, may be
;discarded if not needed
5030 OUT 4,161 ;request high byte
5040 GOSUB 5200 ;wait for entire byte
5050 HIBYTE = CHARIN ;receive high byte
5060 IF (HIBYTE AND 128) <> 0 THEN 5030 ;see if A/D finished
5070 OUT 4,145 ;request low byte
5080 GOSUB 5200 ;wait for entire byte
5090 LOBYTE = CHARIN ;receive low byte
5100 MASKED = HIBYTE AND 15 ;mask off 4 highest bits
5110 VAL = LOBYTE + 256 * MASKED ;combine 12 bit value
5120 IF (HIBYTE AND 15) = 0 THEN VAL = -VAL ;fix sign if neg.
5130 RETURN
5200 IF (INP(6) AND M) = 0 THEN 5200 ;waits for response byte
5210 CHARIN = INP(4) ;gets input from port
5220 RETURN
    
```

log/digital conversion must be retrieved with two commands and reads, rather than one.

The steps involved are:

1. Send ADC-1 the channel number being accessed. This selects the channel and starts A/D conversion.
2. Send the ADC-1 a byte containing the instruction to send back the high byte of data. Then the computer can read the high byte as input.
3. Send the ADC-1 a byte containing the instruction to send back the low byte of data. The computer can read the low byte as input.

To understand the actual coding, there are a few more details to clear up. The modem communication port on the Kaypro is port 4. This is the number that is used with the OUT and INP() statements to send or receive data from the RS-232 device. The status port is 6, and the first bit of the value at port 6 will tell whether a complete byte has been received by the computer. If it's 1, communication is complete. It is a 0 until a complete byte is received.

Another port, 0, is used to set the baud rate for communications. A listing of proper values is in the Kaypro Owner's Manual (the thin one). If the hexadecimal number listed in the book is used, the OUT command must use an ampersand and a capital H before it to identify it as such. For 4800 baud, for example, the command would be:

```
OUT 0, &HC
```

If the number is translated to its decimal equivalent (12, in the case of C), the statement works just fine as:

```
OUT 0, 12
```

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DATA CONTROL SYSTEMS

Refer to the list of steps above, and compare it to the code in the Sample Program. This code should be easy for anyone familiar with MBASIC. The only reason for any complexity at all stems from a single byte's not being large enough to contain the necessary data. Otherwise, it could be a one-command operation.

Most of the other functions of the ADC-1 are operated with one command. The status (on/off) of the digital inputs is read by sending one command with the OUT statement, then reading the results with the INP() function. Once a command has been sent to address a particular BSR-controlled device, that device may be turned on or off, dimmed, or brightened repeatedly with just one command. All the digital outputs are controlled by sending a byte to the ADC-1 in which the first six bits represent the condition (on/off) desired for each output.

Remote Measurement Systems supplies the ADC-1 with interconnection instructions, programming examples, and helpful hints for the Kaypro 2, 4, and 10. When written like the example, the code to run the various features of any ADC can be saved in the form of subroutines.

The ADC is rapidly becoming an indispensable PC peripheral for research, manufacturing, and other professional fields. At present, only the surface of possible applications has been scratched—and that just barely.

Jerry Houston is marketing director for Remote Measurement Systems, the Seattle manufacturer of the ADC-1 system. Houston has degrees in business administration and data processing.

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Rapid-Fire Data Acquisition

Many real-world events happen slowly enough for an ADC to communicate with its host computer each time it takes a reading. Sometimes, however, a user needs to make a series of measurements of a process that happens so quickly there's no time to communicate each value as the reading is made. Some kinds of ADC systems allow analog measurements to be stored in RAM memory for later processing by the host computer.

A good example of such a device is the Starbuck 8232 Data Acquisition and Control System. The 8232 is driven by a 6802 microprocessor and is capable of carrying out a considerable number of instructions without constant intervention by the host computer. There is a limited amount of RAM available for users' own machine-language routines.

In terms of basic specifications, the Starbuck 8232 is a data acquisition and control system with eight analog inputs of 8-bit resolution; it has eight digital inputs and eight controlled digital switches for outputs. It communicates with the Kaypro or other computer via RS-232C interface.

The Starbuck system contains two 2716 PROM chips, which supply the intelligence needed to monitor inputs over an extended period, or to make rapid measurements for a short duration. The available RAM provides room for a buffer (or buffers) big enough to hold a total of 1,975 data points. If only one analog channel is used for data collection, samples may be taken at the maximum rate of 7,200 per second. The rate of data collection has a great deal to do with the length of time available for a test, of course. If there is room to store 1,975 data points, and the samples are taken at 7,200 per second, obviously readings can continue only for about a quarter of a second before the buffer is filled.

Starbuck has provided a means for triggering the 8232 data acquisition system so that it begins acquiring data according to a pre-arranged signal. There are eight commands for the trigger routine, and the user should enter them in proper order.

Starbuck makes available additional kinds of data acquisition routines, such as mid-triggered and post-triggered routines and routines that will input data from multiple channels. For pricing, contact them with your requirements.

The Starbuck owner's manual includes a large variety of do-it-yourself projects for building such circuits as an input amplifier, current-to-voltage conversion, and frequency-to-voltage conversion.

This last is specially important for measuring many kinds of speed, such as rotary motion. □

Product: ADC-1 Data Acquisition and Control System
Mfg: Remote Measurement Systems, Inc.
PO Box 15544
Seattle, WA 98115
(206) DATA 255

Features: 16 analog inputs of 13-bit resolution, four digital inputs, six digital outputs, AC line-carrier transmitter. RS-232 interface with any computer. \$395.

Product: PL-1000
Mfg: Elexor Associates
PO Box 246
Morris Plains, NJ 07950
(201) 299-1615

Features: 16 analog inputs of 12-bit resolution, two analog channels out, 16 digital inputs, 16 digital outputs. Expandable for other features. Basic model is \$549.

Product: Tarus ONE/10
Mfg: Tarus Computer Products, Inc.
4 Limbo Lane
Amhearst, NH 03031
(603) 673-6662

Features: Microprocessor (Z80A) controlled, sophisticated laboratory-quality equipment. Expandable in many ways. Basic system approx. \$3,000.

Product: 8232 Data Acquisition and Control System
Mfg: Starbuck Data Company
PO Box 24
Newton Lower Falls, MA 02162
(617) 237-7695

Features: Microprocessor (6802) controlled, eight analog inputs of 8-bit resolution, eight digital inputs, eight digital outputs. Can record bursts of data. \$540.

Product: MTM1 Basic Microtelemetry Module
Mfg: Software Science
PO Box 44232
Cincinnati, OH 45244
(513) 561-2060

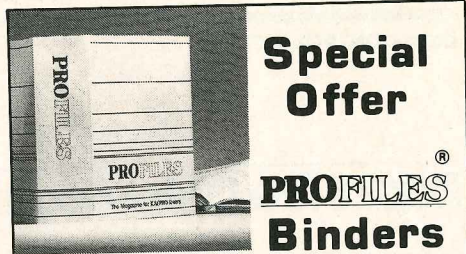
Features: PC board with eight analog inputs of 8-bit resolution, 12 digital outputs. RS-232. \$249.

Product: WB-31 White Box
Mfg: Omega Engineering
PO Box 4047
Stamford, CT 06907
(203) 359-7700

Features: Two analog inputs of 13-bit resolution, four digital outputs. RS-232. \$395. Company also maintains a large stock of data acquisition accessories and sensors and distributes a complete catalog.

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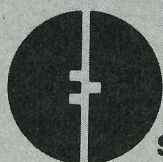
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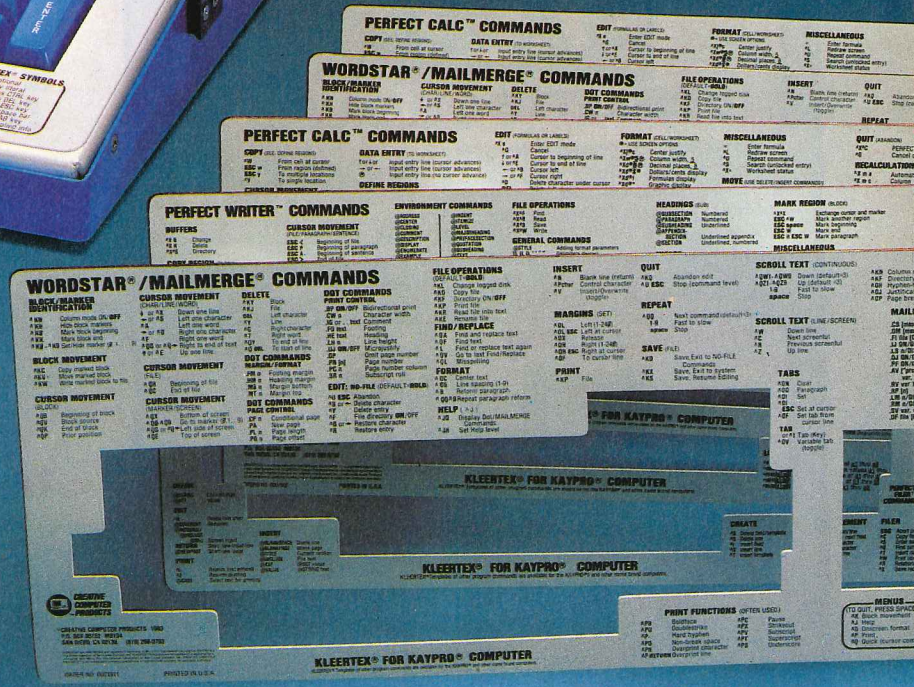
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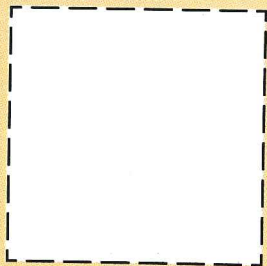
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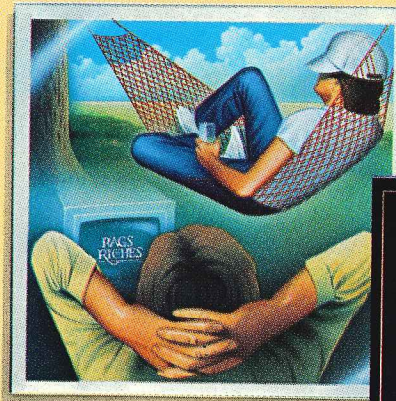
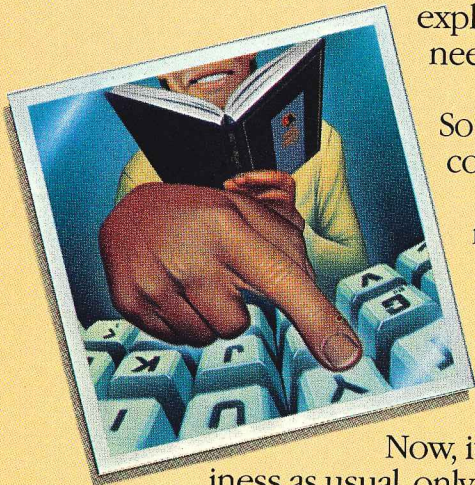
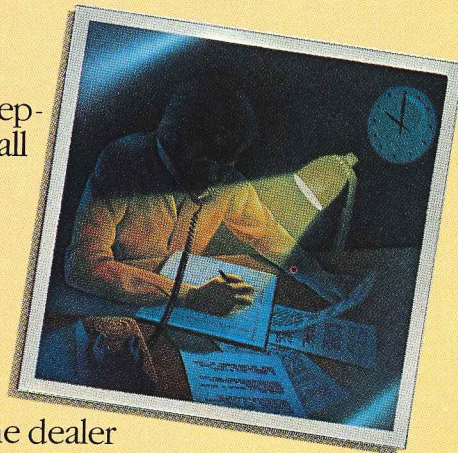
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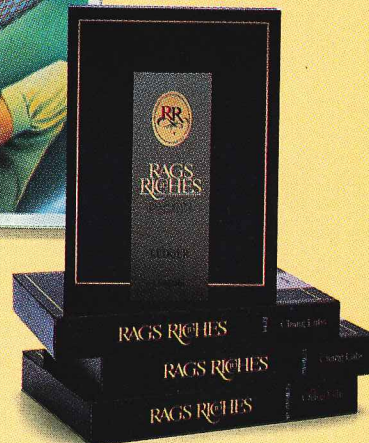
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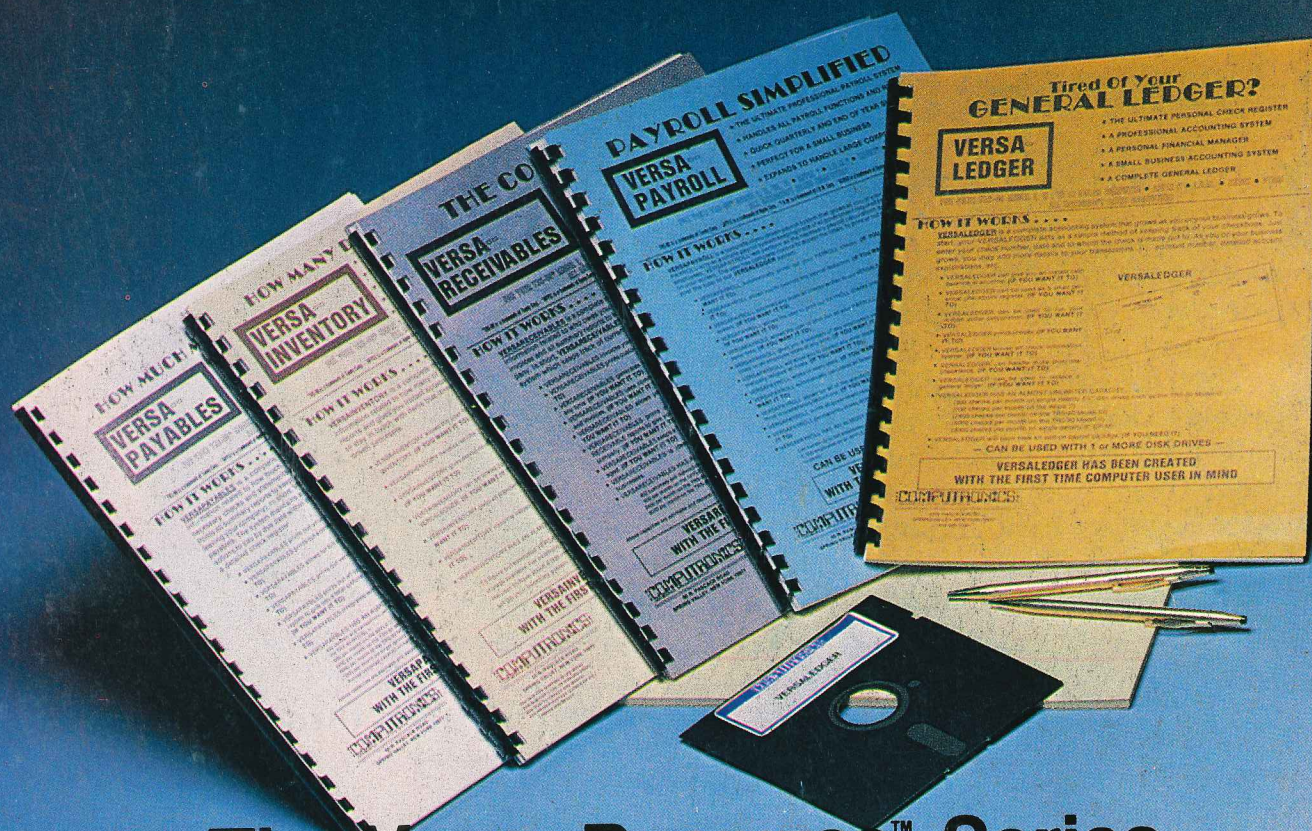
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